PAINT and VARNISH Production

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHES

JANUARY 1955

**Use your present equipment . . .
open or closed kettles . . . and produce
at competitive prices a superior wall paint with . . .**

Now you can add a high quality, odorless flat wall paint to your line without buying special processing equipment. You build your own vehicle *right from the resin* at substantial savings over a purchased vehicle. You can offer your customers a many-ways-better paint at competitive prices.

- ***Excellent Adhesion***
- ***Good Leveling Qualities***
- ***Uniform One-Coat Coverage***
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- ***Good Holdout***
- ***Superior Washability***

Write for the technical bulletin on odorless wall paint today and be the first in your area to take advantage of this new Shell Chemical development.

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CHEMICAL PARTNER OF INDUSTRY AND AGRICULTURE
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For extreme cold weather stability... and economy, too...

NUOLATE LEAD 24% is your drier

Nuolate Lead 24%—made from highly refined tall oil acids—is stable in transit, in storage, in your plant. It flows—and is ready for instant use—even at zero temperature. You save time, you save indoor storage space and you save money, when you use this dependable drier.

Although lower in price than the naphthenates, both exhaustive tests and three years of field experience show that Nuolate Lead 24% has the same drying power per unit of metal.

Because of carefully selected raw materials and superior manufacturing techniques, Nuolate Lead 24% is milder in odor, paler in color and has less thinning action on paints.

What's more, Nuolate Lead 24% is suitable for use in combination with Nuolate Cobalt 6%, Nuolate Manganese 6%, and Nuolate Calcium 4%—in preparing mixed driers for plant use. With Nuolates, you can prepare stock mixtures with the assurance of complete stability.

Contact your Nuodex Representative for working samples, service data and specifications.

NUODEX **NUODEX PRODUCTS CO., INC., Elizabeth, N. J.**

Plants in Elizabeth, N. J., Newark, N. J., Long Beach, Calif., and throughout the world

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Back in the late 1920's Carbide and Carbon Chemicals first used the trade-marks CELLOSOLVE and CARBITOL to identify its new glycol-ethers. Today, with 25 years of experience producing these products, CELLOSOLVE and CARBITOL have become the accepted symbols for CARBIDE's high quality glycol-ethers in dozens of industries where they are used.

If you are considering glycol-ethers in your production, why not check the list below. There may be one or more high quality products to suit your particular needs.

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If you want more information on the uses, delivery, or prices of these high quality glycol-ethers, call the CARBIDE office nearest you. A technical representative will be glad to help you. In Canada: Carbide Chemicals Sales Company, Division of Union Carbide Canada Limited, Toronto.

PAINT and VARNISH Production

(REG. U.S. PATENT OFFICE)

Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOL. 45 JANUARY, 1955 NO. 1

NEXT ISSUE

Our February issue will carry an informative article on the use of chlorosulfonated polyethylene ("Hypalon") in the formulation of flexible, decorative and protective coatings for fabric, metal, rubber and masonry surfaces.

FEATURES

DEPARTMENTS

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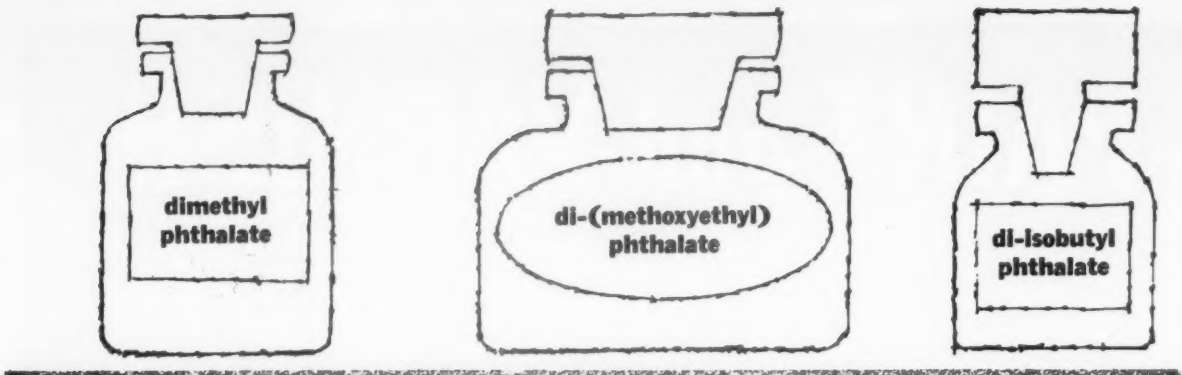

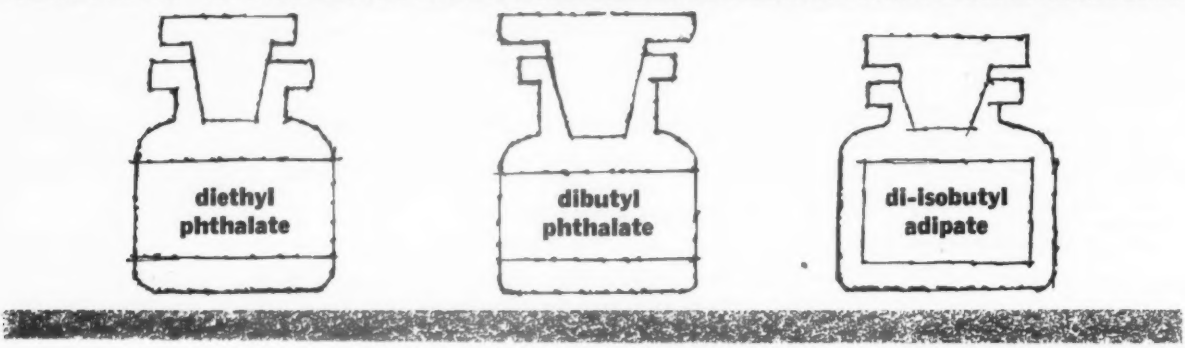

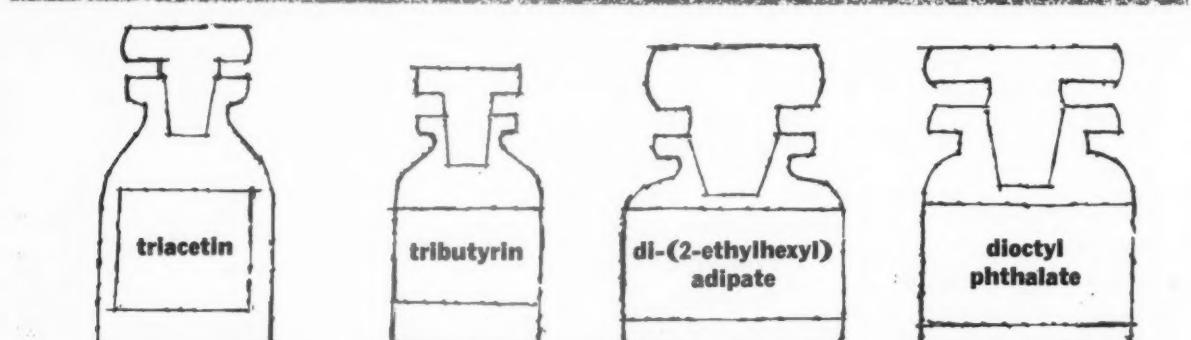

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Call or write for your copy of our PLASTICIZERS booklet. It contains specifications, properties and typical uses for all Eastman plasticizers.

These products are stored in bulk at Kingsport, Tennessee, and Lodi, New Jersey, by Eastman Chemical Products, Inc.; by DeMert & Dougherty, Incorporated, in Chicago and St. Louis, and by Anderson-Prichard Oil Corporation in Akron and Cincinnati.

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Editorial Comment

January, 1955

Prospects and Aspects for 1955

MOST business men in appraising the outlook for 1955 take an optimistic view. Many feel that the slight recession experienced during the first half of 1954 was just another "inventory-recession" and the sustained upswing in business activity experienced during the last six months is expected to carry through 1955. This coupled with the fact that construction activity and consumer spending are at an all-time high indicate a healthy year for 1955.

However, business spending for new plant and equipment is expected to show a downward trend, according to a recent survey of the Commerce Department and Securities and Exchange Commission. Outlays will fall from $6.894 billion in the last quarter of 1954 to $6.096 billion in the first quarter of 1955.

This is considered a high rate, but somewhat below the 1954 capital expenditures. The emphasis with most firms, particularly chemical, will be on plant modernization and new equipment rather than expansion. Attention will be focused on developing more efficient processes for greater production.

Some industries are planning to spend slightly more on expansion. These include electrical machinery, non-electrical machinery, transportation equipment, stone-clay and glass industries. The petroleum industry plans to boost its outlay to over $600 million during the first quarter.

It is the opinion of most economists that the slack forecasted in plant outlays will be taken up by the continued surge of residential building and increases expected in educational buildings, commercial buildings, hospitals and institutions, public buildings, religious buildings and social and recreational projects.

With another boom year in construction predicted, paint manufacturers can look forward to a high level of business during the next twelve months. In this connection, we cannot overlook the importance of the "do-it-yourself" movement which has been making substantial gains over the past years. It has been estimated that the "do-it-yourself" market represents some $6 billion worth of tools and supplies annually, and during the past year sales in this particular market have jumped $1½ billion. This trend will help to keep trade sales items moving at a fast pace.

Other factors which will also contribute toward high levels of paint sales are plans for the automobile industry to produce over six million units in 1955; the steel industry expecting to operate at 75 per cent of capacity at least through the first quarter of 1955; and greater demands of electrical appliances created by the increase in the nation's population, income and number of homes.

However, it must be realized that the lush, easy profit days are over, and we are now in a period of severe competition and lowered profit margins.

What does this mean to the average firm?

It means that in order for any firm to fare well in this economy, it must adopt a vigorous program of promotional activity and new product development coupled with hard selling.

In addition, firms must explore every phase of their production with the idea of keeping operating costs down to a minimum.

The most encouraging aspect of our present economy is the growing consumer population. Our present population is almost 165 million and within the next ten years is expected to reach 185 million.

This predicted increase in our population will undoubtedly be the most important factor in keeping construction activity at high levels. Add to this the increased demands for household goods, appliances, utilities, etc. created by more dwellings, one cannot help but take an optimistic view of our national economy in the years before us.

The headache that was nailed to a tree

Fewer years back than you might imagine, our ancestors had the idea that a tree could accommodate them by taking over a headache.

The technique was simple. The sufferer wrapped a lock of his hair around a nail and whacked it into the most convenient timber.

Unitol, the refined tall oil, is a forest product that does a more scientific job of relieving mental strain.

This superior tall oil costs substantially less than the components it replaces. Paint manufacturers like its light color, quick drying characteristics and high viscosities.

Economical Unitol simplifies processing too. Many users have reduced manufacturing costs in addition to their savings on raw materials.

unitol

THE REFINED TALL OIL

Chemical Sales

UNION BAG & PAPER CORPORATION

Woolworth Building, New York 7, N. Y.

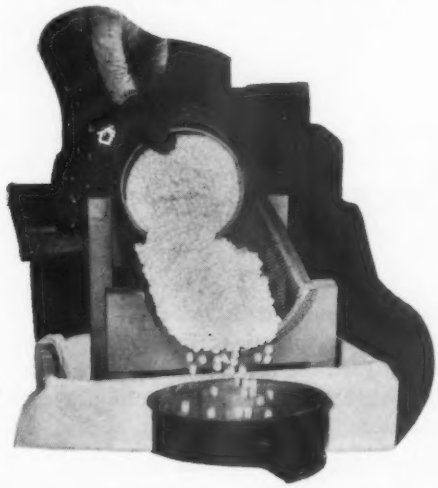
1,000-mile road haul proves

NATIONAL MALEIC ANHYDRIDE TABLETS

contain 75-90% less fines "as delivered"

By truck from producing points to Buffalo, to Chicago and back to Buffalo again went drums of three manufacturers' Maleic Anhydride. Then the contents of each drum were carefully screened and the 2 mesh "fines" weighed. Here's what the scales showed:

NATIONAL "TABLETS"—1.12 lb. BRAND A—7.78 lb. BRAND B—10.40 lb.



NATIONAL "TABLETS" 1.12 lb. "FINES" | BRAND A 7.78 lb. "FINES" | BRAND B 10.40 lb. "FINES"

We knew our new Moundsville plant was making exceptionally good-to-look at, easy-to-handle Maleic Anhydride. We knew our new tablet form resists degradation in shipping and handling. But, frankly until now we didn't fully realize how downright all-around good National Maleic Anhydride Tablets really are. There's no price premium on this premium quality product. So why not have the advantages of uniform, quick-dissolving, safer-to-handle National Maleic Anhydride Tablets by sending your next order to our nearest office?

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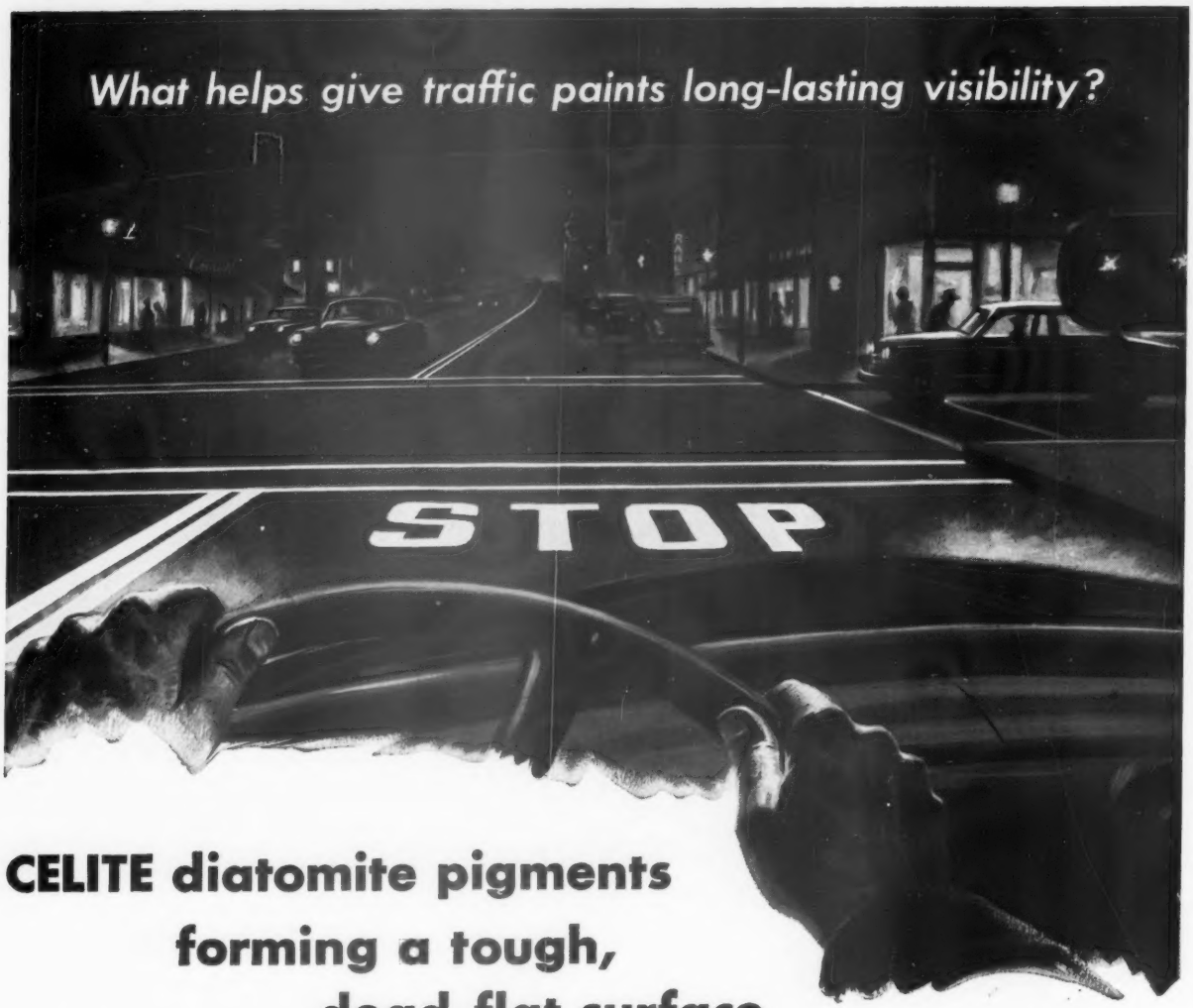


CELITE diatomite pigments forming a tough, dead-flat surface

Intricately shaped Celite particles, shown in photomicrograph above, project through the film to produce a highly visible textured surface.

TRAFFIC LINES are only as good as their visibility. That's why many states specify Celite in their traffic paints. These microscopic particles roughen the texture of the paint film cutting gloss and creating a flat surface that is highly visible under all conditions both day and night.

What's more, being silica, they are strong and rigid, imparting abrasion and wear resistance. Celite speeds drying by permitting the paint film to breathe. This also counteracts the usual flaking and cracking action caused by the vapor pressure of moisture coming through the concrete.

Celite particles provide better adhesion to any road surface, increase body and give good workability. For further information write Johns-Manville, Box 60, New York 16, New York. In Canada, 565 Lakeshore Road East, Port Credit, Ontario.

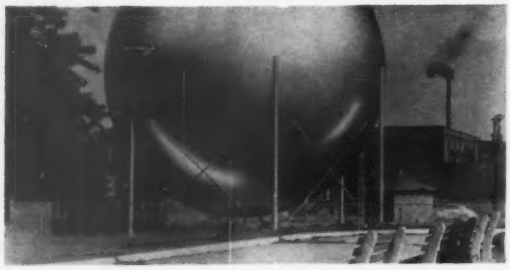
JOHNS-MANVILLE JM PRODUCTS

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products

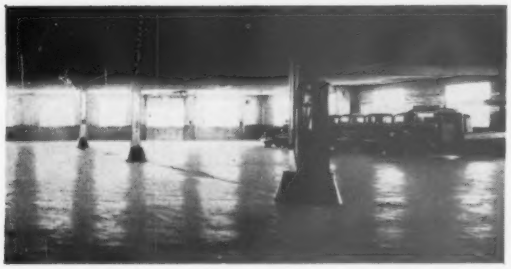
Johns-Manville CELITE THE EXTENDER PIGMENTS FOR ALL COATINGS

with BAKELITE COMPANY you have

for the RAILROAD INDUSTRY: Don't forget: the railroad industry requires coatings of many types . . . for steelwork and bridges, for station interiors and exteriors, for rolling stock. For freight cars, coatings based on BAKELITE Vinyl Resins have proved considerably longer service life, with very low maintenance despite corrosive loads, rough handling, vibration, and severe weather.

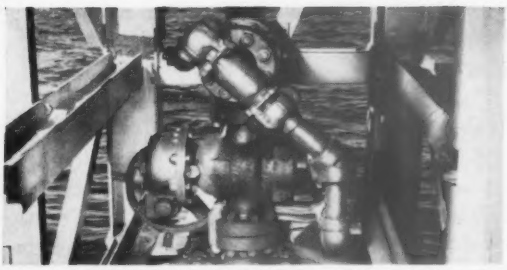


for the CHEMICAL INDUSTRY: It's a big market for your coatings. And BAKELITE Resins give the performance that makes satisfied repeat customers. For example: on storage tanks for gases and solvents, an oil-base system deteriorated badly after only one year. Tanks finished with a coating system based on BAKELITE Vinyl Resins remained in top condition with no detectable corrosion.

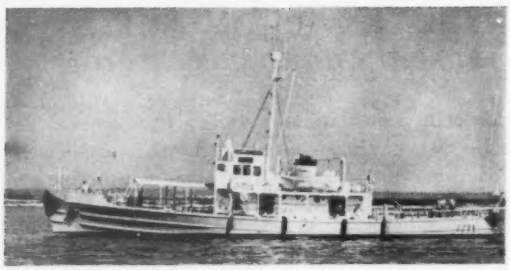


for the BUILDING INDUSTRY: You can formulate for all types of surfaces, increasing your sales package. For concrete flooring, an air-dry enamel finish, based on BAKELITE Phenolic Resins showed less than 10% wear after five years of heavy truck traffic and operations of this bottling plant and warehouse.

for the AUTOMOTIVE INDUSTRY: Primers, as well as finish coats, are a source of big volume. With BAKELITE Vinyl Butyral Resins you can formulate wash primers that bond firmly to aluminum and steel without flaking. They provide a firm grip for topcoats, and prevent creepage of corrosion even when topcoats are scratched.



for the PETROLEUM INDUSTRY: Offshore wellheads of two major oil companies used to require a full-time continuous painting program. Now, with a coating system based on BAKELITE Vinyl Resins this costly maintenance has been replaced with routine check-ups. The new finishes are permanently neutral, chemical resistant, non-oxidizing and non-heat-reactive.



for the MARINE INDUSTRY: Weather, rough service, salt-water and corrosive cargoes all demand tough coatings. You can sell this market with tested finishes based on BAKELITE phenolic resins for superstructures, interior metalwork and equipment, deck varnishes, and anti-fouling coatings for below the waterline. Tests show continued perfect protection after more than three years' service.

DEFINED QUALITY STANDARDS

for coating resins of many uses

YOU KNOW

- **exact standards and test methods**
- **products will be of uniform high quality**

From the large variety of resins Bakelite Company supplies, you can fill your major resin requirements for versatile coatings for many markets. BAKELITE *Defined Quality* Standards give you a rigid and dependable definition of the resins you use. These published standards can contribute in large measure to the uniformity and performance of your products . . . *and to the reputation and profit of your company.*

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TRADE-MARK
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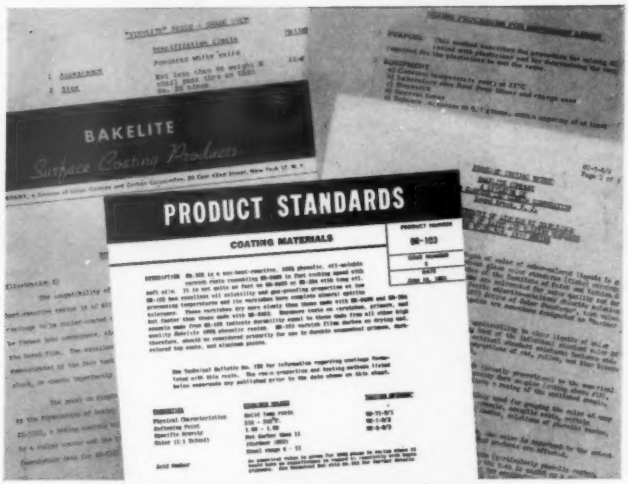

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For the greatest number of types of resins

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- VINYL CHLORIDE RESIN
- VINYL ALCOHOL-ACETATE RESIN SOLUTIONS
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- VINYL BUTYRAL RESINS • POLYETHYLENE RESINS
- 100% PHENOLIC-NON-HEAT HARDENING
- 100% PHENOLIC-HEAT HARDENING
- DISPERSIONS
- PHENOLIC "RESIN BAKING" RESINS AND SOLUTIONS
- POLYSTYRENE EMULSIONS
- EPOXY RESINS

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In addition to data sheets and manuals there are booklets that can give you market ideas, and show your customers how coatings based on BAKELITE Resins protect structures and equipment in practically every industry. For information and literature write to Dept. ZT-75

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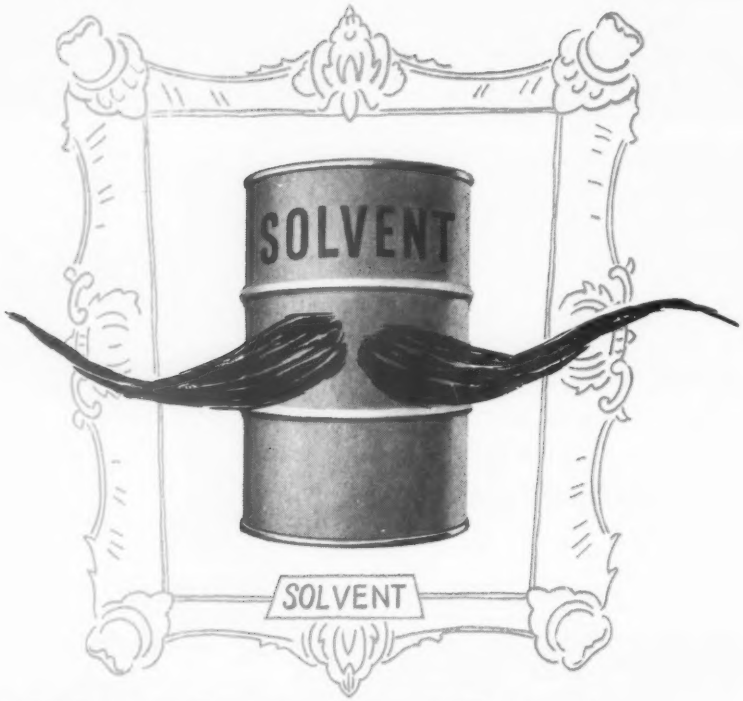
can a Solvent be "old-fashioned"?



a Solvent Survey can tell you!

The lacquer solvent picture is changing. Many old standards are holding their own but others are being replaced by more effective, less expensive solvents—solvents to precisely meet your special needs. Picking the "perfect" solvent is a job for a specialist. That's where your Celanese representative comes in.

He offers you a wide range of solvents, special and standard . . . long personal experience in the lacquer field . . . and the facilities and services of the fully-equipped paint technology section of Celanese Technical Service & Application Laboratories—ready to review formulations, make tests, comparisons, costs analyses.

A revaluation of your solvent picture can give you the competitive edge you want. Ask your Celanese representative for the details. Celanese Corporation of America, Chemical Division, Dept. 558 A 180 Madison Avenue, New York 16, N. Y.

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n-Butyl Acetate
Isobutanol
n-Butanol
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Celanese* CHEMICALS

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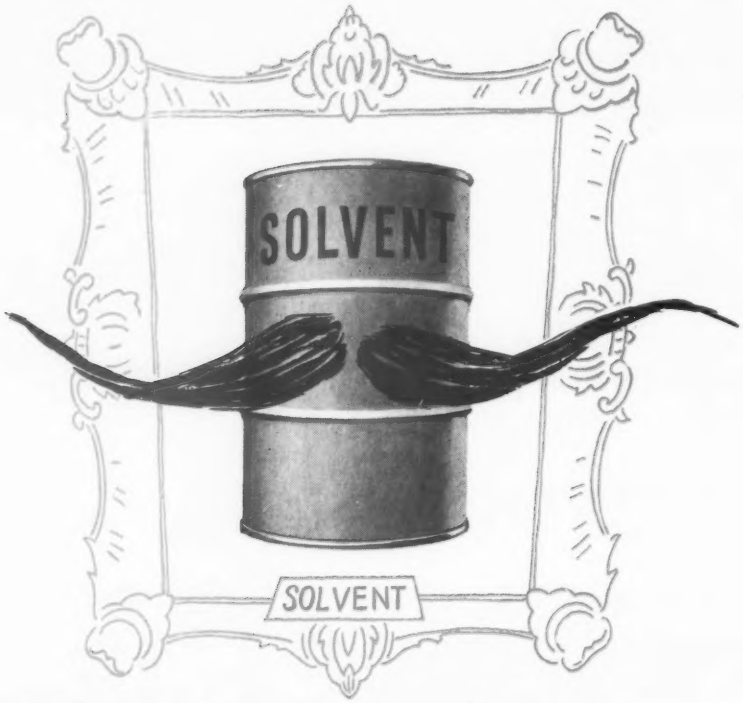
can a Solvent be "old-fashioned"?



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SPECIALIZED

Acetone
n-Propanol
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Isobutanol
n-Butanol
Celanese Solvent 203
Celanese Solvent 601
Celanese Solvent 901-H
Methanol

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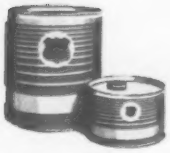
Soltrols are available in 4,000 or 8,000 gallon tank cars, or in 6,000 gallon compartment cars containing both Soltrols. Phillips customers enjoy prompt service and dependable supply at all times. Write for complete information.



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HERE'S WHAT TO LOOK

COMPARATIVE LATEX PROPERTIES

Property	Gen-Flo Latex	Latex A	Latex B	Latex C	Latex D
Viscosity—cps.	21	21	18	77	14
Residual Styrene %	0.03	0.02	0.22	0.07	0.05
Odor	Very Mild	Very Mild	Ammonia	Sour Sweet	Mild
Mechanical Stability %	0.03	0.02	0.03	Creamed-Thickened	Custard Consistency
Film Specs	Good	Good	Poor	Fair	Excellent
Stabilization System	Balanced	Balanced	Over Stabilized	Over Stabilized	Under Stabilized

NON-MODIFIED PAINTS

Tests						Control Paint
Freeze-Thaw Stability						
Original—cps	880	360	580	580	1120	2000
After 1st cycle	780	360	600	780	coag.	2200
After 2nd cycle	740	350	580	720	—	1850
After 3rd cycle	700	340	560	660	—	1380
After 4th cycle	850	370	620	900	—	2010
After 5th cycle	900	360	740	1260	—	2560
Scrubs to Failure		16 hours at −20° F. 8 hours at 77° F.				
24 hour dry	2000+	2000+	393	2000+	2000+	2000+
48 hour dry	2000+	2000+	2000+	2000+	2000+	2000+
Cleansability (strokes to remove)		Fed. Spec. TT-P-0029 with standard brush				
Crayon	41	47	100+	93	34	100+
Ink	20	20	8	4	16	4
Lipstick	100+	100+	31	34	100+	33
Mercurochrome	100+	100+	15	100+	100+	4
Pencil	100+	100+	100+	100+	100+	46
		Fed. Spec. TT-P-0029 with standard brush, except Bon Ami instead of soap solution				

OIL MODIFIED PAINTS

Freeze-Thaw Stability						
Original—cps	2050	1490	1180	930	2490	3200
After 1st cycle	2230	1500	1700	1610	coag.	1980
After 2nd cycle	2170	1590	2280	3090	—	2070
After 3rd cycle	2100	1880	2650	4870	—	2360
After 4th cycle	2260	1810	3580	6680	—	2180
After 5th cycle	2450	1790	5310	coag.	—	2060
Scrubs to Failure						
48 hour dry	219	138	87	90	267	65
96 hour dry	1000+	1000+	240	186	1000+	80
Cleansability (strokes to remove)		Fed. Spec. TT-P-0029 with standard brush				
Crayon	35	24	37	18	19	25
Ink	10	7	31	5	18	17
Lipstick	54	46	73	36	33	15
Mercurochrome	100+	100+	80	47	100+	69
Pencil	59	83	85	25	27	58
		Fed. Spec. TT-P-0029 with standard brush, except Bon Ami instead of soap solution				

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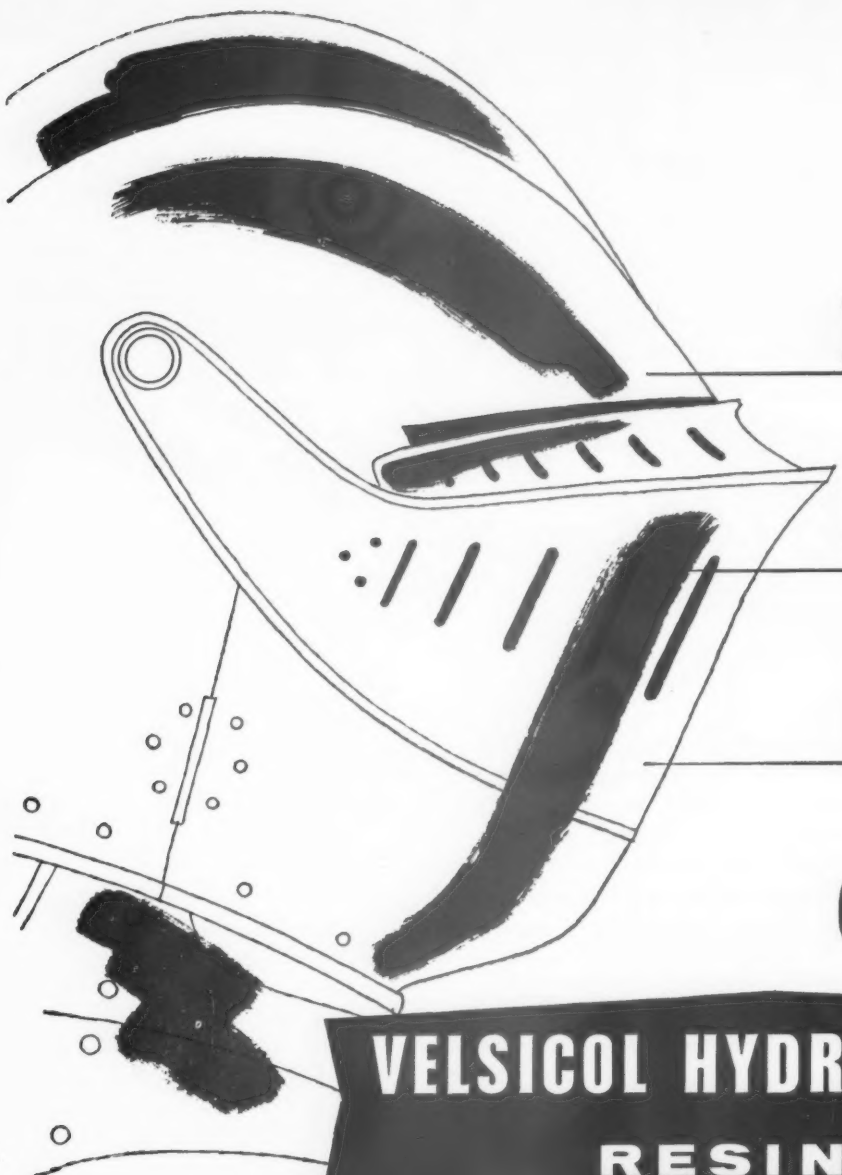

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RAW MATERIALS FOR NEW LATEX PAINT VEHICLES

By
A. E. Pufahl

THE paint industry has made many advances over the past years. In general, these advances have been made possible by the availability of new raw materials which have given better performance. The latest advance is latex paints. This advance may prove to have a most far-reaching influence on the paint industry.

We in the chemical manufacturing industry believe latex paints have a tremendous future. They bring into application resinous materials which could not be considered in the past because of formulating difficulties. They permit the adaptation to paints of plastic materials which have been so successful in other fields of the plastics industry.

Actually, the rise of latex paints can be considered as an acceptance and growth of an idea and techniques, rather than utilization of brand new raw materials. The idea and techniques, rather than utilization of brand new raw materials. The idea, of course, is the utilization of water as a dispersing medium for the resin—where all other means have proven unsuccessful.

The raw materials for latex paints are not new—as such. They are polymeric substances of a thermoplastic nature. These polymer resins are formed by reaction of unsaturated monomeric compounds—either with themselves or with other similar unsaturated compounds to form resinous compounds of great chain length. These resins have been utilized in the plastics industry in the form of sheets, tubes, fibers, and cast and molded articles through application of the well known extrusion, molding, spinning, rolling, and calendaring operations.

These polymer resins are very high molecular weight. Consequently, their solutions in the usual solvents are so viscous, even at low concentrations, as to render them inoperable for most common paint uses. However, using proper emulsifiers and protective colloids, these resins can be dispersed as very finely divided particles in water. Even at high solids content in water, the viscosity of the dispersion is quite low.

Fortunately a preferred method of forming these high molecular weight polymers is emulsion polymerization—that is, polymerization of a dispersion of the monomer in water. The monomer is dispersed in water with an emulsifier and a protective colloid and polymerization takes place under the influence of heat and catalyst. Conditions can be selected such that the product polymer remains dispersed in the water and is eminently suited to adaptation to latex paint formulations.

So it is the acceptance by the paint industry of *the idea* of utilizing water as the carrying medium for these resins which has given latex-based paints their decided impetous in recent years. It has now placed at the disposal of the paint chemist a very large variety of resinous materials—not new to the plastics industry, but new to the paint field—which should lead to some extremely interesting new surface coatings.

Markets

Let's look briefly at the markets available for latex paints. The magnitude of the potential market for latex paints has been predicted by many people. In the journals all of us have read estimates which indicate potentials as great as 130 million gallons per year or more. Already there is some history to look back on. The first polymer to be used in a latex paint was natural rubber. It enjoyed limited success because of its obvious shortcomings—rapid aging and poor light fastness.

High styrene-butadiene copolymer latices got their start in the paint field a few years ago and made a very rapid climb. In 1949, 4 million gallons of paint based on this latex were sold in the interior paint market. By 1951 sales went to 20 million gallons, and in 1952 sales were 40 million gallons. I haven't seen the 1953 figures, but I believe the sales fell slightly short of the 60 million gallon sales level predicted in 1952. It is interesting to note that a 40 million gallon sales figure represents a retail dollar volume of $175,000,000 and constitutes 45% of the total dollar volume for all interior paints. It also constitutes about 15% of all paint, varnish and lacquer sales in this country.

The styrene-butadiene latex case history affords a dramatic example of the entry of latex paints into the industry. However, the styrene-butadiene latex is unsatisfactory for exterior application, and has certain shortcomings in the interior field.

There do exist raw materials for the preparation of resin latices which are suitable for exterior application, which can be utilized in the special applications markets, and which can do a better job in certain applications in the interior field. We hope to indicate to you

*Dr. A. E. Pufahl is Chief of Technical Service, Carbide & Carbon Chemicals Co., New York, N. Y. This paper was presented before Vehicle Manufacturers' Group Meeting of the New York Paint, Varnish and Lacquer Association, Sept. 23, 1954.

MONOMERS	Surface Coatings (Latex Paints, etc.)	Textiles	Adhesives	Molding Resins	Oil Additives	Leather Finishes	Polyester Resins	Synthetic Rubber	Paper Coating
1-Acetoxybutadiene									
Acrolein Cyanohydrin		X							
Acrylic Acid and Esters	X	X	X	X	X	X	X	X	X
Acrylonitrile	X	X	X	X		X	X	X	X
Allylidene Diacetate		X		X			X	X	X
Butadiene					X	X	X	X	X
Crotonic Acid	X		X	X					X
Ethyl Crotonate	X		X	X		X	X	X	
Fumaric Esters	X	X	X	X				X	
Maleic Esters	X	X	X	X	X			X	X
Methacrolein	X	X	X	X				X	
Methyl Vinyl Acetate	X	X	X	X		X	X	X	
Sodium Polyacrylate	X		X					X	
Sorbic Acid	X								
Styrene	X	X	X	X		X	X	X	X
Vinyl Esters	X	X	X	X	X	X	X	X	X
Vinyl Ethers	X	X	X	X	X	X	X	X	X
Vinyl Pyridine									
2-Vinyl 5-Ethyl Pyridine		X	X					X	

Checklist of industries served by polymers from Carbide monomers

some of these raw materials. Thus, the ultimate market for latex paints at the apex of their development may be a very appreciable portion of the total 550 million gallon coatings market. How fast and how far these resin latices go depends very much on the valuable work which your own people are now doing with these materials in the field.

Raw Materials

What are these raw materials which have already found application in the plastics industry and which are now being evaluated carefully by your industry? The raw materials for the new high molecular polymers for use in the paint field are the unsaturated compounds produced by the chemicals industry. As a chemical manufacturer, *Carbide & Carbon Chemicals Company* alone produces 48 of these materials in semi-commercial or commercial lots. Table I is a check list of industries served by polymers from Carbide monomers. Table II lists the unsaturated monomeric compounds which are available.

Not all unsaturated compounds produced by the chemicals industry are, of course, adaptable to the manufacture of resins suitable for the paint field.

Characteristics of the Monomers

Most of these unsaturated monomers polymerize with themselves to give a resin of a definite set of characteristics. These characteristics can be modified somewhat by adjustment of the length of the polymer chain through modification of the operating conditions. However, it is gratifying that each can be relied upon to give certain combinations of characteristics specific to its own polymers.

In general, it is desirable to polymerize a monomer to as high a molecular weight as possible. This develops to the greatest extent the inherent and desirable properties of tensile strength, chemical resistance and resistance to aging.

Many of these monomers will copolymerize with other monomers, and in so doing impart to the resulting copolymer certain of their own polymer characteristics. This feature greatly expands the degrees of freedom and permits the tailor-making of resins which combine the most desirable characteristics which can be supplied by the individual monomers.

Referring to the list of monomeric compounds produced by Carbide & Carbon Chemicals Company you will note that Carbide monomers tend to "run in families". This provides an additional degree of freedom in the preparation of polymers, as we shall discuss. Thus you will note that Carbide produces vinyl acetate and is now producing several of the higher esters such as vinyl butyrate, vinyl 2-ethyl-hexoate and vinyl crotonate. You will note that in the acrylic ester family, the vinyl ether family and in the maleic ester family there also are several members. This is logical because we produce a series of alcohols which are the raw materials for certain of the families. Correspondingly, as original producers of vinyl acetate, it has been logical for us to consider the manufacture or other vinyl esters based on our manufacture of butyric acid, 2-ethylhexoic acid and crotonic acid.

The availability of several members of a family of monomers is important because it extends the scope of properties obtainable in polymers. Each monomer within a given family gives polymers which, while retaining certain basic

Table II. A listing of the unsaturated monomers which are available.

LARGE TONNAGE MONOMERS

Monomers

→ Vinyl Acetate
$CH_2=CH-OCOCH_3$

→ Butadiene
$CH_2-CH-CH=CH_2$

→ Styrene
$CH_2=CH-C_6H_5$

→ Acrylonitrile
$CH_2=CH-C\equiv N$

FINE CHEMICALS MONOMERS

Acrylic Acid and Esters

→ Ethyl Acrylate
$CH_2=CHCOOC_2H_5$

→ Methyl Acrylate
$CH_2=CHCOOCH_3$

→ n-Butyl Acrylate
$CH_2=CHCOOC_4H_9$

2-Ethylbutyl Acrylate
$CH_2=CHCOOCH_2CH(C_2H_5)C_2H_5$

→ 2-Ethylhexyl Acrylate
$CH_2=CHCOOCH_2CH(C_2H_5)C_4H_9$

3-Ethoxypropyl Acrylate
$CH_2=CHCOOCH_2CH_2CH_2OC_2H_5$

"Cellosolve" Acrylate
$CH_2=CHCOOC_2H_4OC_2H_5$

Monomers

→ Glacial Acrylic Acid
$CH_2=CHCOOH$

Polyacrylic Acid

Sodium Polyacrylate

Maleic Esters

Dimethyl Maleate
$CH_3OOCCH=CHCOOCH_3$

→ Diethyl Maleate
$C_2H_5OOCCH=CHCOOC_2H_5$

→ Di(n-butyl) Maleate
$C_4H_9OOCCH=CHCOOC_4H_9$

→ Di(2-ethylhexyl) Maleate
$C_8H_{17}OOCCH=CHCOOC_8H_{17}$

Di (methyl "Cellosolve") Maleate
$CH_3OCH_2CH_2OOCCH=CHCOOCH_2CH_2OCH$

Di (methyl amyl) Maleate
$CH=COOCH(CH_3)CH_2CH(CH_3)_2$
''
$CH=COOCH(CH_3)CH_2CH(CH_3)_2$

Diisopropyl Maleate
$(CH_3)_2CHOOCCH=CHCOOCH(CH_3)_2$

Fumaric Esters

Diethyl Fumarate
$C_2H_5OOCCH=CHCOOC_2H_5$

Di (n-butyl) Furmarate
$C_4H_9OOCCH=CHCOOC_2H_5$

→ Di (2-ethylhexyl) Fumarate
$C_8H_{17}OOCCH=CHCOOC_8H_{17}$

Methacrolein
$CH_2=C(CH_3)CHO$

Methyl Vinyl Acetate
$CH_2=C(CH_3)OOCCH_3$

Allylidene Diacetate
$CH_2=CHCH(OCOCH_3)_2$

→ Crotonic Acid
$CH_3CH=CHCOOH$

Vinyl Ethers

Vinyl Methyl Ether
$CH_2=CHOCH_3$

Vinyl Ethyl Ether
$CH_2CHOC_2H_5$

Vinyl n-butyl Ether
$CH_2=CHOC_4H_9$

→ Vinyl Isobutyl Ethers
$CH_2=CHOCH_2CH(CH_3)_2$

Vinyl 2-ethylhexyl Ether
$CH_2=CHOCH_2CH(C_2H_5)C_4H_9$

Vinyl methoxyethyl Ether
$CH_2=CHOCH_2OCH_3$

Vinyl butyoxyethyl Ether
$CH_2=CHOCH_2CH_2OC_4H_9$

Vinyl trimethylnonyl Ether
$CH_2=CHOCHCH_2CH(CH_3)_2$
/
$CH_2CH(CH_3)CH_2CH(CH_3)_2$

Divinyl "Carbitol"
$CH_2=CHOC_2H_4OC_2H_4OCH=CH_2$

Vinyl chlorethyl Ether
$CH_2=CHOCH_2CH_2Cl$

Monomer

New Vinyl Esters

Vinyl Formate
$CH_2=CHOOCH$

→ Vinyl Propionate
$CH_2=CHOOCCH_2CH_3$

→ Vinyl Butyrate
$CH_2=CHOOCC_3H_7$

→ Vinyl 2-ethyl Hexoate
$CH_2=CHOOCCH(C_2H_5)C_4H_9$

→ Vinyl Crotonate
$CH_2=CHOOCCH=CHCH_3$

1-Acetoxybutadiene
$CH_2=CH-CH=COOCCH_3$

2-Vinyl 5-Ethyl Pyridine

Ethyl Crotonate
$CH_3CH=CHCOOC_2H_5$

Acrolein Cyanohydrin
$CH_2=CHCH(OH)CN$

Sorbic Acid
$CH_3CH=CHCH=CHCOOH$

characteristics of the family, nevertheless differ from each other. In general, the lowest member of the family gives the hardest, toughest polymers. Polymers of the higher members are softer and tackier. To illustrate this point, the polymer of methyl acrylate is practically tack-free, has medium flexibility, fairly high tensile strength, rather high water absorption, a fairly high brittleness temperature, and can be saponified under certain conditions. The polymer of 2-ethylhexyl acrylate on the other hand is very sticky, very soft and plastic, has practically no tensile strength, exhibits extremely low water absorption, has a very high brittleness temperature, and is quite resistant to saponification.

Selection of Monomers

In our limited time, it is impossible to set forth all of the properties of the polymers obtainable from the monomers we have mentioned and those included in the Carbide list. This is a job which is done in better detail in the technical information sheets which we and other monomers producers supply. When you consider the combinations of characteristics which might be afforded by copolymers, you can see that presentation of a full picture might take several days of discussion. However, I would like to mention a few of the factors involved in charting a program of development of suitable polymers for latex paint applications.

One of the factors which comes up very rapidly in such consideration is the matter of cost in dollars and cents, and it might be well to take this into account initially. In order to obtain the maximum and most practical results in the shortest time, your polymer chemists must focus their attention on those materials which have the greatest availability and availability potentials along with the necessary low-cost characteristics. Incidentally, this factor had a considerable influence on the development of the original styrene-butadiene copolymers. The raw materials were available having the backed-up production capacity which was becoming surplus from the war-time rubber program, and the monomer products were low priced. It was logical they should receive initial great interest.

Basic Monomer Starting Points

The products which today have, in our estimation, the necessary immediate large tonnage availability and low price prerequisites are as follows:

	Current Tank Car Price per Lb.
Vinyl Acetate	16.5c
Butadiene	15.0c
Styrene	21.0c
Acrylonitrile	31.0c
Vinyl Chloride	13.25c
Vinylidene Chloride	14.50c

We have narrowed our list of available products down rapidly to what seems to be a comparative few products. This does not mean we have totally eliminated from consideration the use of other products produced by ourselves and others in the monomer manufacturing business. It merely means that we are defining these materials as those of immediate interest on which to base latex resin development for the short term. The other more expensive, less available monomers may in time fit this group; for the present we believe they will find their place as comonomers where they are used in lower concentrations in combination with the lower-cost materials already indicated.

Considering the list which we have already singled out as our basic starting point for preparation of latices, it should immediately be recognized that the straight polymers of these monomers are not completely satisfactory in forming surface coating films. The way in which they fail and how this can be corrected can best be discussed by considering how a latex paint film dries. It is quite different from the drying of a film laid down from solvent solution. The film dries by evaporation of water leaving behind the finely divided particles. The formation of a suitable surface coating film depends to an appreciable extent on the "fusing" of these particles together. With the exception of acrylic ester polymers, the straight polymers do not undergo this fusion, or cold flow, to a satisfactory degree. To promote this "fusion" a plasticizer such as tricresyl phosphate, dibutyl phthalate, or di-2-ethylhexyl phthalate can be used. No doubt you are familiar with some of the dispersions which are now on the market—dispersions of polyvinyl acetate, polystyrene, polyvinyl chloride—which can be used with an external plasticizer in this fashion.

One elegant answer to this problem of providing a film with the proper fusing characteristics and final flexibility in the film is to go back to the polymer itself. In other words, modify the polymer through copolymerization to provide the necessary inherent characteristics. This, as you know, is now an application. "Internally plasticized" copolymers of vinyl acetate with dibutyl maleate, acrylic esters and higher vinyl esters are already on the market.

You know, of course, there is considerable controversy about this point—"internal" versus "external" plasticization. In taking sides in this controversy it is important to bear in mind that the use of comonomers to afford internal plasticization, and thereby promoting fusibility of the film, also can be made to give other benefits not donated by external plasticizers. Some of these benefits are improved water resistance, emulsion stability, aging resistance, adhesion, etc. We personally believe copolymers are here to stay. So we should consider some of the *comonomers* which ought to be an initial part of our development program for latex paint resins.

In briefly noting the shortcomings of straight polymers of our monomers, and pointing to two methods to overcome these deficiencies, we hasten to admit there is one elegant exception—polyethyl acrylate. No doubt the question has arisen in your mind as to why we have excluded this material from our primary list of basic monomers since it is already in application in latex paints on the market. The answer is it does not satisfy the necessary low-cost monomer requirements. Polyethyl acrylate is a single outstanding example of a straight polymer which requires no plasticizer, either externally, to perform in a completely satisfactory fashion in film formulation. Polyethyl acrylate does indeed provide an

excellent latex paint vehicle, perhaps the best approach to the ideal system thus far devised. The excellence of acrylic polymers as surface coating compositions has been known almost as long as the monomers themselves. Polyethyl acrylate has the required flexibility, the required adhesion characteristics, and the required water and chemical resistance. Beyond this, it affords us other benefits such as excellent clarity of film and resistance to aging almost unparalleled in the field. Emulsions are quite stable at essentially neutral conditions. The additives necessary to make a formulated paint operable are at a bare minimum. Now on the market are paints based on what we believe to be polyethyl acrylate. In the long run, however, it is our personal belief that the acrylic family likely will not capture the lion's share of the promising paint vehicle market as straight polymers. We say this strictly because we know of no means at present to manufacture acrylic ester monomers to sell for prices in the range of vinyl acetate, styrene or butadiene. While there will always be a place for straight polymers of ethyl acrylate in the paint field for certain applications, when the market becomes genuinely competitive we feel the acrylates will suffer from a price disadvantage.

We do feel, however, that acrylates have a definite place in the latex paint field as lesser components in copolymers with the basic monomers indicated above. Thus, we should expect to see the inherent flexibility characteristics, water resistance, resistance to aging which characterize 2-ethylhexyl acrylate straight polymers carried over to a certain extent into copolymers with vinyl acetate.

Comonomers For Latex Paint

By the above reasoning several other monomers produced by Carbide have been eliminated from consideration as basic monomers, but definitely should be considered as comonomers. Some copolymer systems are already on the market, including those of vinyl acetate with butyl maleate, di-2-ethylhexyl maleate, ethyl acrylate, 2-ethylhexyl acrylate, vinyl butyrate and vinyl 2-ethylhexoate. I have taken the liberty of marking on your Carbide monomer sheets those comonomers which at this stage of development are known to be the most attractive. These are indicated with arrows.

Very briefly I would like to give you a "thumbnail sketch" of the monomers which we have marked. For each let's consider the status of manufacture, current and future prices, and the properties which can be imparted to copolymers through their use.

Since there is presently an extremely active interest in vinyl acetate, suppose we consider it as our principal monomer, and indicate the influence of comonomers on vinyl acetate polymers. As a reference point, straight polyvinyl acetate—unplasticized—forms films which are tack-free, hard and brittle, having fairly high tensile strength, high water absorption, high brittleness temperature (which is another measure of flexibility), and which are quite easily saponified.

Acrylic Esters

The first group to consider are the acrylic esters. The members of this group copolymerize very nicely with all of the basic monomers we have listed. Ethyl acrylate and methyl acrylate are now manufactured in large tonnage at sales prices of 42¾ cents per pound in tank cars. The long range price potential for these two is 30 to 35 cents per pound. The higher acrylates, as represented by butyl acrylate and 2-ethylhexyl acrylate, have only recently come into large commercial manufacture in our new Institute, West Virginia plant. Both of these materials now sell for 75 cents per pound in drum quantities, but can be expected to reach about 55 cents per pound in tonnage lots within a few months.

When used to the extent of 25 to 30 per cent in a vinyl acetate copolymerization, ethyl acrylate gives internal plasticization or flexibility, improved water resistance, greatly improved adhesion and considerably better emulsion stability. Similar results can be obtained by utilizing butyl acrylate at 20 to 25 per cent concentrations and 2-ethylhexyl acrylate at 15 to 20 per cent concentrations.

Glacial acrylic acid is now priced at $1.15 per pound. It is manufactured on a commercial scale both by ourselves and by others. It has a price potential in the range of 75 to 90 cents per pound in the future. Fortunately from an economic standpoint only small amounts are required, of the order of 2 to 5 per cent, to perform the function of markedly improving the adhesion characteristics of polyvinyl acetate, particularly to smooth surfaces such as metal.

Maleic Esters

The maleic esters are now manufactured in large volume. Current prices range from 35 to 50 cents per pound. Although substantial increases in manufacturing volume would mean price reductions, we do not forecast prices below 35 cents per pound.

Maleates cannot be polymerized by themselves. However, they copolymerize very nicely with vinyl acetate. Dibutyl maleate and di-2-ethylhexyl maleate at monomer concentrations of 25 to 30 per cent in vinyl acetate definitely impart internal plasticization, improved adhesion and greater wear and water resistance.

Vinyl Ethers

Insufficient work has been done to date on the basis of which to give concrete indications of the effect of higher vinyl ether constituents on vinyl acetate copolymers. This is probably due to the fact that vinyl ethers do not polymerize in the same way the other materials in our listings do. In addition, ethers are susceptible to hydrolysis in emulsion polymerization, although this effect is markedly minimized among the higher vinyl ethers such as vinyl isobutyl ether.

There is active interest in materials such as vinyl isobutyl ether because they tend to promote adhesion to other vinyl acetate copolymers, definitely reduce the water absorption, and the polymers are not easily saponified. The higher vinyl ethers bear consideration in a latex research program because of their potential low cost in volume—approximately 30 cents per pound.

Crotonic Acid

Crotonic acid is now produced in large volume. It is currently priced at 45 cents per pound.

(*Turn to page 68*)

DRYING OIL TECHNOLOGY

PART I

STATUS OF DRYING OIL TECHNOLOGY

MAN has been using fats and oils since prehistoric times. He used them for fuel, illumination, nutrition, art materials, religious ceremonies, and the preservation of artifacts. Man apparently knew about drying oils like linseed oil long before the Christian era. His pre-ice age cave drawings indicate the use of mineral colorants that might have been dispersed in some kind of oil. He must have known then how to derive oil from at least one of the available types of seeds, nuts, plants, fish or animal fats.

Until recently, though, man's chemical knowledge of fats and oils was extremely limited. He used them pretty much in their natural state. He was helpless, for the most part, when it came to transforming non-drying and semi-drying oils into useful coating intermediates. For this reason, we in the coatings industry have in the past tended to regard only a few oils as valuable—namely the drying oils, particularly linseed oil.

Today, however, it's a different story. New chemical knowledge has relieved helplessness. Radical transformations *can* be made. That is significant for it means we must reappraise the various fats and oils.

Continued technical improvements will soon dwarf the importance of natural chemical properties such as iodine number or diene number. On the other hand, economic factors like location of supply, yield, or value of by-products will surely become major considerations in our choice of fats and oils in the near future.

It means new concepts in paint formulation and it means the emergence of a new industrial giant —oleochemicals—to concern itself with the modification of fats and oils to meet specific needs.

This is the first in a series of articles on "Drying Oil Technology." Part I is chiefly concerned with sources of vegetable oils and methods of isolation.

Refining operations and treated oils will be discussed in detail in Part II, scheduled for our February number.

Sources of Oils

Oleaginous plants are extensively distributed throughout the world in a great variety of climates and soils.

With the exception of olive, tung, stillingia, and red palm oils, which are obtained from the meat of the plants, vegetable oils are usually embedded in the protoplasm of the seed cells. Those free from starch are richest in oil. The stored oil serves as a source of food and energy during the early growth of the plant.

Animal fat occurs in the fatty tissue of the higher classes of animals. It is enclosed in special cells and collects in large quantities in separate parts of the body.

Isolating the Oils

Probably the earliest method of extracting oil from an oil-bearing source consisted of crushing clean dried fatty material between heavy stones. The meal thus obtained was boiled in water and the oil skimmed from the surface of the water. Thus the seed was subjected to five primary operations: screening, drying, crushing, cooking and pressing.

With the exceptions of drying (which we now recognize as often unnecessary) and pressing (now slowly being replaced by solvent extraction), present day engineering operations are essentially the same. They involve the following steps.

First, *screening* to remove gross impurities such as stones, twigs, stems, and leaves.

Then, when deemed necessary, *drying*. Certain oil sources—coconut meats, for example—contain a relatively high percentage of moisture which, if not removed at this time, would interfere with subsequent operations.

Some seeds and fruits—soya beans, peanuts and cottonseeds, to mention a few—also require *decorticating* or dehulling. That is, the seeds or fruits are passed through a series of rolls which crack the hard outer hulls. A screening or blowing process then separates the hulls from the kernels.

Next, crushing of the seeds or kernels is done by means of a series of steel rolls.

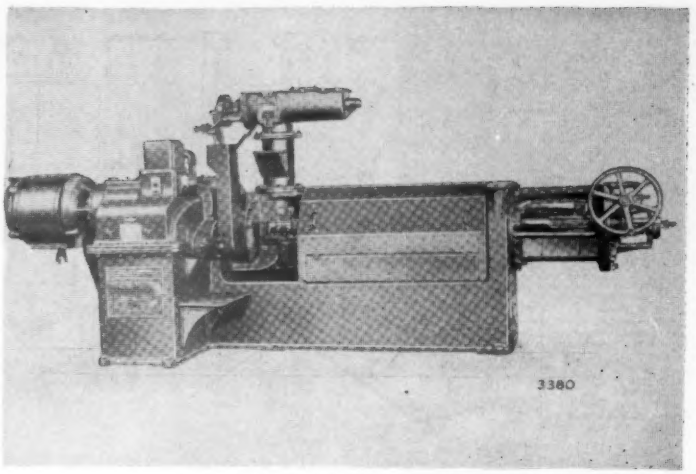
This series of articles are being prepared by the Editorial Staff of Paint and Varnish Production.

This is followed by "*cooking*", i.e., the passage of live steam directly into the crushed seed. The steam displaces the oil globules in the seed and causes the protein material to coagulate, inducing higher yields.

Finally, the oils are extracted from the "cooked" crushed seed by either *pressing* or *solvent extraction*. In a continuous pressing process, expellers are usually used to carry out the crushed oil seed. The Anderson expeller, a typical one, is a long, tapered cylinder perforated with numerous small holes. The prepared seed is fed continuously into the cylinder by menas of a screw conveyor. As the seed is pushed through the cylinder, the pressure forces the oil through the perforations. This continuous process may be contrasted to the batch process in which simple hydraulic presses are used.

Solvent extraction is the more modern method of winning an oil. There are various systems for this, each designated, as a rule, by the name of the inventor or manufacturer. A general continuous countercurrent operation runs as follows:

The oleaginous material is fed by a screw conveyor into the bottom of a vertical tower. As the material passes upward through the tower, it is met by a descending stream of solvent. This solvent extracts the oil from the oil bearing material and finally leaves the bottom of the tower. The solvent and oil are then carried to a conventional solvent recovery unit.



Courtesy of the French Oil Mill Machinery Co.

Screw press used for scalping or pre-pressing operations

Fish oils are usually obtained by first boiling the fish in water and skimming off the crude oil. This mixture of fish oil and water is then screened to remove coarse suspended solids. The mixture may then be sent through a vibrating screen before a final separation through a centrifugal separator.

Refining Raw Oils

Crude raw oil is rarely used because it contains mucilaginous matter, "break", or "foots", which are believed to consist of carbohydrates, albuminous materials, phosphatides, carotenoid pigments, fine dirt, moisture, fatty acids and other deleterious matter.

Raw oils must be treated to eliminate these impurities in one or more of several ways. The treatment is known as refining and it includes these processes:

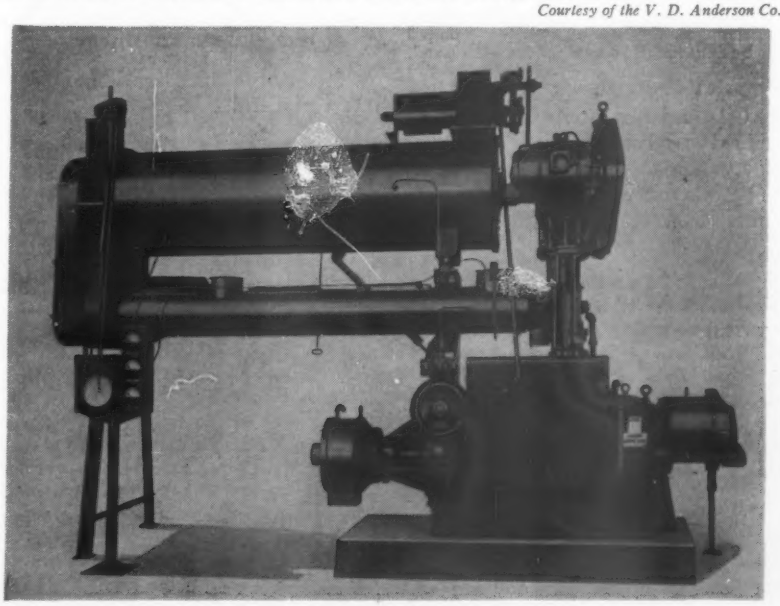
1. break stabilization
2. bleaching
3. acid refining
4. alkali refining, and
5. refrigeration.

The refined oils may then be further processed in the refinery to yield modifications often classified as follows:

1. boiled oils
2. varnish oils
3. grinding oils
4. blown oils, and
5. polymerized oils

Twin motor cooker expeller for straight pressing of linseed and tung oil; also used in a number of plants for prepressing the same material prior to solvent extraction, according to the manufacturer.

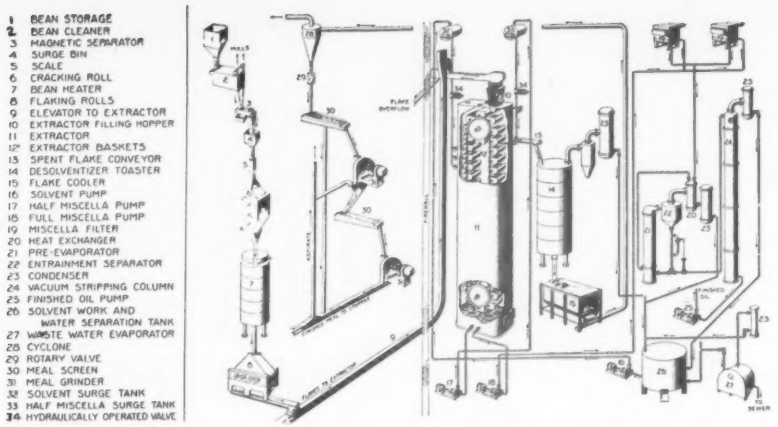
Courtesy of the V. D. Anderson Co.



Growth of a Technology

It is not surprising that technological evolution has led us to treat crude glyceride oils in more and more sophisticated ways. In fact, the entire history of the development of a drying oil technology bears a striking resemblance to that of the more publicized petroleum technology.

In the early days of the petroleum industry, the crude petroleum was physically separated into various rough fractions by means of distillation or extraction. In many



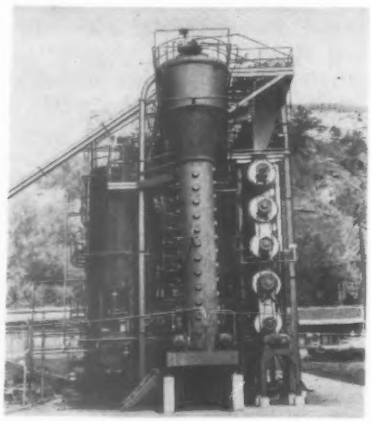
Courtesy of the French Oil Mill Machinery Co.

Flow diagram showing solvent extraction of soybeans.

cases, the crude petroleum was used in the same form as recovered from the ground. The gross fractions were marketed as gasolines, kerosenes, lube oils, and waxes. As the art of refining developed, the various fractions became more and more homogeneous. This parallels development in the art of glyceride oil refining.

In time, many of the petroleum products were obtained from deliberate chemical transformations induced by increased temperatures, pressures, and catalysts. These were related to but not normally present in crude petroleum. In drying oil processing, similar transformations were effected by means of boiling, blowing, and polymerization processes.

In recent years, both petroleum and drying oil technologists entered yet another chemical phase. They began making *drastic* chemical alterations. As a result, products markedly different from the original oil have been produced. We have seen already how this has brought about the establishment of a huge petrochemical industry. An oleochemical industry—to be concerned with the conversion of glyceride oils into useful chemical intermediates—cannot be far behind.



Courtesy of the V. D. Anderson Co.

Pittsburgh Plate Glass Co., Red Wing, Minn. operating on the Exsolex process is reported to be extracting 250 tons per day of flaxseed.

Physical Processes

Oils and fats occur in nature as mixed triglycerides of saturated fatty acids. (Refer to Table I.) The oils are expressed from seeds, nuts, fish, or animal fat deposits under conditions of high pressure and elevated temperatures. The resulting crude oils, after refinement to eliminate undesirable constituents, may be used in the preparation of paints, varnishes, inks, or linoleum. Sometimes the oils are treated further in order to increase viscosity or to improve pigment grinding properties.

Major advances in drying oil technology were limited for many years to the improvement of processing techniques, i.e., controlled heating systems, improved materials of construction, utilization of inert atmospheres, superior mixing equipment, more efficient adsorbents, more efficient refrigeration systems, etc. However, hand in hand with the growth of organic chemistry came an increasing awareness of the fundamental nature of oils. The new knowledge and improved techniques facilitated the uncovering of novel reactions and the discovery of better methods of carrying out known reactions.

No attempt will be made here to treat developments chronologically, but it may be said that the earlier advances were physical in character and included these processes:

1. fractional distillation of fatty acids
2. molecular distillation of oils at high vacuum
3. solvent extractions and segregations
4. removal of antioxidants
5. adsorption separation of the glycerides
6. catalyzed modifications
7. ester interchange

(*Turn to page 70*)

TABLE I.
Approximate Fatty Acid Compositions of The Common Oils of Commerce

Oil:	Linseed	Perilla	Soybean	Safflower	Tung	Oiticica	Castor	Coconut	Olive
Iodine No.	180	193	132	130	165	140	88	10	85
Fatty Acids:									
Saturated	9	7	13	8	4	10	2	90	12
Oleic	19	10	27	32	6	16	7	8	83
Ricinoleic	—	2	—	—	—	—	88	—	—
Linoleic	25	34	54	60	2	—	3	2	5
Linolenic	47	49	6	—	—	—	—	—	—
Eleostearic	—	—	—	—	88	—	—	—	—
Licanic	—	—	—	—	—	74	—	—	—

The above values are approximate and vary with source.

ODORLESS THINNERS 1954

By
George W. Waters*

An appraisal of technological developments of odorless, alkyd oil base formulations

ODORLESS thinners have been marketed by the petroleum industry for upwards of five years, and the idea of producing paint volatiles free of odor is much older even than that. Greatest activity, however, in the widespread development of odorless oil base paints has occurred over the past eighteen months to two years during which period odorless, alkyd, oil base paints have firmly established themselves. As the production and consumption of these modern surface coatings continue to increase, associated technical problems yield to the cooperative study of the paint and raw materials industries. It seemed timely to reassess this youthful member of the family of paint raw materials and to ascertain its current status of technical growth.

To attempt a realistic appraisal, recourse was taken to the time-honored expedient of a questionnaire. Initially the questionnaire was intended to augment the author's information developed through direct contacts and discussions. Reception of the questionnaire, however, was much more enthusiastic than anticipated, to the extent that, despite a necessary qualification, it has been decided to review the answers received individually. This necessary qualification of the questionnaire involves its numerically limited distribution. About forty sets of answers have been received, well over 50% of the number distributed. Although paint and resin industry representation was reasonably covered and geographically the East Coast, Midwest and West Coast were included, the small numbers of questionnaires distributed and received obviously preclude claims to nationwide population coverage with respect to these industries. The results must, therefore, be regarded more along the lines of a "Gallup Poll". Within this qualification, the answers represent a sampling of technical opinion within the consuming industries of odorless paint thinners.

General Picture

Briefly, what sort of a picture do the answers to the questionaire portray? In the main, the technology of odorless, alkyd, oil base formulations continues to develop. Problems remain associated with the low compatibility features of odorless thinners, but these problems are being solved. Some opinion holds that differences in odor quality and odor stability exist among currently available odorless thinners, but these are matters which can be corrected by the refiner as they are called to his attention. It appears that currently odorless thinners may not possess optimal evaporative characteristics, but solution of this problem merely awaits definition of these proper volatility characteristics through cooperative study, now underway, by the petroleum and surface coatings industries.

With regard to ease of application, emulsion (latex) paints are rated superior to both odorless and conventional, alkyd, oil base paints which, in turn, are held to be roughly equivalent. With regard to appearance, abrasion resistance and washability, however, the converse is true—emulsion paints rate a definite third place. It is reasonably to be expected that the majority still find that conventional alkyd paints outrank odorless alkyd paints with respect to these three qualities. In fact, it is encouraging to learn that one third of the answerers give the nod to the odorless alkyd paints over the conventional when it is reflected that up to 15 years' development work has gone into the conventional paints. On the other hand only two or so years have been expended in solving the problems of formulating with the low compatibility of odorless thinners which not only poses difficult technical problems but sharply curtails the flexibility of the formulator who, heretofor, has had no commensurable compatibility difficulties with thinners for interior, architectural coatings.

A realistic recognition of the problems which are associated with the formulation of odorless, alkyd, oil base paints is essential to their continued rapid development. There appears little room for doubting their firmly established entry into the field of modern surface coatings—their public acceptance has assured that. It is almost redundant, especially for the readers of this report, to point out that odorless oil base paints make available for the first time a practical, "do-it-yourself" paint which retains the quality provided by alkyd resins and allows complete freedom from the disagreeable and irritating odors of conventional paint thinners, historically obnoxious for interior architectural decoration. It is on this basis that the growing success of odorless, oil base paints is assured.

Questionnaire

The questionnaire consisted of ten questions purportedly designed to facilitate quick and easy answering by means of a (x) mark to indicate the selection among a set of supplied

*Mr. Waters is connected with the Shell Oil Co., New York, N. Y.
The author is grateful for the assistance of the members of the surface coatings industries who filled out the questionnaire. This report could not have been as informative without their cooperation.

answers. While there were a few complaints that the questions were not clear or the allowable answers not extensive enough, in general, the system proved adequate, and about 5 to 10 minutes sufficed to complete the form. The questions and answers will be considered individually.

Question Number 1

"Check one or more: In my opinion odorless thinners as they are available today are:

(a) satisfactory in all respects ....
(b) need improvement in odor stability ....
(c) need improvement in evaporation rate ...."

Total number of replies: 39

Distribution of replies:

(a)	9
(b)	11
(c)	13
No answer	5
?	1

It must be admitted that Question Number 1 was deliberately slanted away from the compatibility (solvency) features of the thinner. Were this option to be offered as a possible answer to this question, it was feared that the opportunity to obtain information on odor stability and volatility would be curtailed. Question Number 2 provided an opportunity to touch on compatibility.

Within the scope of this questionnaire it appears that volatility characteristics and odor stability of current odorless thinners leave something to be desired. Consideration of the volatility characteristics will be withheld for the discussion of Question Number 7 other than to remark that existence of this problem will end as soon as the desirable volatility characteristics of odorless thinner can be defined. With this information the petroleum industry can produce what the surface coating industry deems necessary in this respect.

The relatively pronounced dissatisfaction with respect to the odor stability of odorless thinners is nothing short of surprising. There is no question but that the petroleum industry is technically equipped to supply odorless thinner with intrinsic odor stability adequate to withstand any practicable degree of storage and handling. It is true that there is variation in odor stability among the products in this class on the market today. Any difficulty along these lines can be solved simply by the purchaser of odorless thinner specifying to his supplier the degree of intrinsic odor stability he needs.

Question Number 2

"Is the low solvency power of odorless thinners an obstacle to the formulation of satisfactory interior odorless paints? Yes....; No....."

Total number of replies: 37

Distribution of replies:

Yes	24
No	13

Of greatest interest here is the relatively high percentage who report poor compatibility as no obstacle to formulation. This gives a direct measure of the progress in formulating with thinner of Kauri Butanol Value in the range of 25 and Aniline Cloud Point of 185° F. (85° C.). As more formulators enter the field of odorless, alkyd, oil base paints, and encounter, head on, this problem it will continue to be rated as an obstacle. Thirteen formulators out of thirty-seven rating this problem as solved is a far cry from the practically unanimous complaint of only two years ago.

Question Number 3

"Check one: In formulating alkyd base odorless paints, it is most expedient to:

(a) completely redesign the vehicle ....
(b) use a blend of two vehicles ....
(c) use an additive with the vehicle ....
(d) use a minor percentage of a higher solvency naphtha ...."

Total number of replies: 40

Distribution of replies:

(a)	26
(b)	4
(c)	5
(d)	3
"None"	1
No answer	1

Based on other discussions, "completely redesign the vehicle" was the expected answer here, and it is seen that the majority confirmed this expectation. In fact, this redesign of the vehicle is quite probably the obstacle alluded to by the replies to Question Number 2. Redesigning a vehicle, always an "obstacle", is particularly challenging when preservation of the quality of alkyds within the compatibility limits of odorless thinners is the stake. But it has been done and further, there are appearing new vehicles designed for these media with surpassing qualities. Exemplary among these are the epon ester vehicles recently developed and announced by *Shell Chemical Corporation* for odorless systems.

The remainder of the replies to Question Number 3 are distributed about evenly among the three other options with one report that none of these four possibilities is expedient. Considering Option (d) first, the paucity of selectors of this expedient comes somewhat as a surprise, for this practice is certainly more widespread than is indicated herein. It is, unfortunately, too common practice to adjust volatility (wet edge, etc.) of odorless paints by the use of a sizable portion, 10-25% vol., of a refined, deodorized kerosene. Basic solution to this volatility problem lies in the selection of an odorless thinner with proper evaporating characteristics. It is open to question whether this selection is optimally possible today; further cooperative development between the petroleum and surface coatings industries is necessary to resolve this point. However, it must not be overlooked that the use of refined kerosene does ease the compatibility problem notwithstanding the fact it inevitably entails a sacrifice in odor quality.

Selection of Option (c) in answer to Question Number 3, while in the neighborhood of 10%, indicates the absorption into formulation technology of such expedients as the Shell Alkyd Reduction Technique, that is, the use of glyceryl mono-oleate or similar material to obtain compatibility, reduced viscosity and viscosity stability of alkyd-odorless thinner systems. Independent discussions among the industry disclosed continuing increased employment of this technique, which, as it is studied further, is found to furnish additional benefits. The most recent disclosure along these lines, reported by the *Kessler Chemical Company*, indicates a flattening of the temperature-viscosity relationship of alkyd-odorless thinner systems in the presence of glyceryl mono-oleate. This effect is, in itself, of prime importance independent of the other benefits. Of course, the use of additives under the Alkyd Reduction Technique is not restricted to glyceryl mono-oleate.

Question Number 4

"Check one or more: Odorless thinners contain the following types of hydrocarbons

(a) paraffins ....
(b) olefins ....
(c) naphthenes ....
(d) aromatics ...."

Total number of replies: 43

Distribution of replies:

(a)	25
(b)	3
(c)	4
(c)	?(1)
(d)	0
?	1
No answer	9

There is a deplorable tendency to formulate and market paints under the "odorless" label which contain low odor or even poorer quality (odorwise) thinners. While there is not necessarily anything wrong with these products as surface coatings, they do affect adversely the truly odorless, oil base paints on at least two major counts. First, they defame in character the truly odorless thinners in that they present an untrue picture to the consumer who is being educated to expect complete freedom from solvent odor, and second, they impose an injustice on the formulator who uses the truly odorless thinners at greater raw material cost. Unfortunately, due to the subjective and hence controversial nature of odor, it is proving extremely difficult to devise a valid and generally acceptable test to establish odor quality. At the moment, therefore, the only basis for insuring that the thinner is odorless is through its freedom from aromatic and naphthenic hydrocarbons. It is of importance, thence, that the consuming industry know of the hydrocarbon composition of odorless thinners. They are paraffinic and almost completely isoparaffinic as the result of their synthesis through the copolymerization (alkylation) of low molecular weight olefins and paraffins. A trace of olefins may occur in the finished odorless thinner but concentration of this type of hydrocarbon must be kept extremely low to achieve odor quality and odor stability.

Question Number 5

"Check one or more The use of odorless thinners in paint and resin formulations requires

(a) separate tankage ....
(b) separate lines ....
(c) separate kettles ....
(d) separate let down tanks ....
(e) separate grinding facilities ....
(f) separate mixers ...."

Total number of replies: 88

Distribution of replies

(a)	34
(b)	25
(c)	5
(d)	9
(e)	5
(f)	7
?	1
No answer	2

The replies to Question Number 5 indicate major agreement that odorless thinners require separate tanks and lines throughout the paint and resin industries. This reflects similar practice by the petroleum industry which also segregates tank cars for handling this material. It is questionable, however, whether this expensive duplication of equipment need be carried as far as the selection of the other options of Question Number 5 indicates. Careful cleaning of such equipment as kettles, mixers, mills, etc., should be adequate insurance against loss of odor quality when used in odorless processing. Based upon experience, it has been found that serious impairment of odor quality requires bodily contamination of odorless thinner which should be easily avoidable with good housekeeping practice in the paint plant. It is possible that this factor is posing a groundless deterrent or hardship upon the paint and resin industries which can be eliminated upon closer study.

Question Number 6

"Is it necessary to protect odorless thinners and odorless paints against exposure to vapors and fumes from non-odorless thinners and non-odorless paints? Yes....; No....."

Total number of replies: 38

Distribution of replies:

Yes	10
No	16
No	?(1)
No answer	11

This question bears somewhat on the same subject as Question Number 5. While the expected majority expressed the opinion that no protection is necessary for odorless thinners against impairment through contact with vapors, quite unexpectedly large percentages held either to the contrary view or held no opinion. Candidly, the intent of the question was to "lay the ghost" that odorless thinner is an "odor thief". Obviously this was not accomplished. Within the experience of the author's Company, no difficulties have arisen from any tendency of odorless thinners to become contaminated through exposure to odorous vapors. None will dispute that oil refineries are not devoid of odors, although processing of odorless thinners and, in general, all petroleum products is carried out in closed systems. On the other hand, paint and resin plants are also quite odorous, and further, much of the processing is done in open mixers, kettles and on open mills. If odorless thinner were an odor thief, certainly the formulation of odorless paints could not be carried out in the typical paint plant. Since practical experience indicates the contrary, the conclusion is forced that impairment of odor quality of odorless thinner through contact with odorous vapors is not a problem. The explanation is, of course, that contamination from such exposure to be harmful would have to extend to bodily absorption of foreign material through condensation of the vapors into the liquid phase and commingling with the odorless thinner. Unless this mechanical contamination occurs, there is little chance for difficulty.

Question Number 7

"Check one: Odorless thinners escape from paint films

(a) more rapidly than ....
(b) less rapidly than ....
(c) at about the same rate as .... conventional thinners of the same boiling range."

Total number of replies: 37

Distribution of replies:

(a)	15
(a)	?(1)
(b)	8
(c)	10
No answer	3

It is incorrect terminology to label the volatility of odorless thinners as a problem. As they exist today, odorless thinners represent, volatilitywise, the material defined by the paint formulator as what he needed. As his ideas, and hence, his needs change, the volatility characteristics must be redefined, and the petroleum industry will produce the material desired. The "problem", of course, consists in defining these optimal volatility requirements, as the distribution of the replies to Question Number 7 indicate.

Formulation of odorless paints, especially those based on alkyd resins, is yet in its early stages of development. Technical problems have been encountered because of the low compatibility features of these thinners. To overcome these features new vehicle systems have been devised, ranging from completely redesigned solids through blends of solids to the use of additives with solids. In short, several variables have been changed simultaneously, all of them potentially capable of influencing drying properties of the film. It is difficult to separate these effects and ascertain what contribution is made by the thinner and in what direction and to what degree the thinner should be modified.

Odorless thinners, compositionwise, are fundamentally different from petroleum derived thinners used heretofore in the paint and resin industries. Being composed of isoparaffinic hydrocarbons, they are among the least polar of organic compounds—certainly the least polar material which has ever been used as paint thinner. These physico-chemical differences must inevitably modify the absorption-adsorption relationships of the systems which, in turn, will modify the mechanism and rate of dissipation of the thinner from the

drying film. From the opinions gathered by the questionnaire roughly 40% find odorless thinners escape more rapidly, 22% less rapidly and 27% at about the same rate as conventional thinners of the same boiling range. This wide variance of opinion can only reflect the fact that other compositional changes, made in all probability to adapt formulations to odorless thinners, are preventing the precise definition of optimal volatility characteristics for odorless thinners. And the thinner itself because of its low polarity behaves differently. It is frequently reported that the "solvent release" of odorless paints is much more rapid than that of conventional paints—that odorless thinner is "squeezed out" of the film—that viscosity build-up during film drying occurs earlier and at a greater rate. Further, alkyds designed for odorless systems are generally cooked just short of the gel point so that their films set up earlier and more rapidly. This apparently higher volatility (relatively) of odorless thinners in coatings formulations is demonstrated by a recent study which evaluated wet edge and dry-to-touch times for five flat wall formulations which differed only in the volatility and hydrocarbon composition of the thinners used. The basic formula of the paint is shown in Table I, and the relative volatilities of the unblended thinners are represented by evaporation curves in Figure I. In Table II are given the boiling ranges and hydrocarbon compositions of these thinners and, as well, the wet edge and dry-to-touch times observed with the respective films.

BASIC FORMULA

	Pounds	Gallons
Titanox RCHTX	585	21.6
China Clay	121	5.6
Asbestine	145	6.1
ADM No. 1241 (100% solids)	146	17.2
Thinner as indicated	322	49.5
	1319	100.0
Lead Naphthenate (24%)	3.5	
Cobalt Naphthenate (6%)	1.25	
Ramapo Blue	Less than 1%	
P/B	1.95	
P. V. C.	66	
K. U.	70*	

*Consistencies of all paints adjusted with "Cellosolve" to conform to that of the Mineral Spirits formulation

Table I

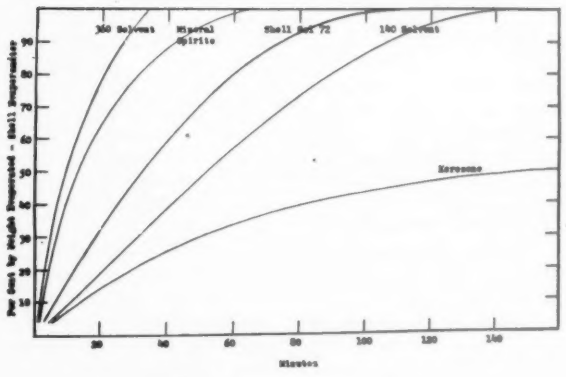


Figure 1. Relative volatilities of the unblended thinners are represented in the above curves.

Study of the data of Table II and Figure I shows that the evaporation rates of the neat (that is, unblended) thinners are of the order and magnitude as would be expected from their boiling ranges. And with one notable exception, the wet edge and dry-to-touch times also conform to normal expectations. This one exception, however, is notable in that it is associated with odorless thinner, "Shell Sol 72". Wet edge time with this thinner is, within the limits of the test, equivalent to that of Mineral Spirits despite the major differences in boiling ranges and evaporation rates. It is interesting to note that while some of the same effect is present in the dry-to-touch observations, it is not nearly as pronounced as the wet edge time disclosures. This is understandable in that the vehicle solids contribute more to the latter property than to wet edge time.

Fair percentages of the replies to Question Number 7 indicated either a need for even faster evaporating odorless thinners or satisfaction with the products as they are. Since the entire surface coatings industry must be satisfied, it appears that two grades of odorless thinners differing in volatility is the answer. These two grades should be such that through blends they will provide satisfactory thinner systems for the industry. This approach is currently being studied cooperatively by the petroleum and surface coatings industries.

Question Number 8

"Except for volatility characteristics are all odorless thinners on the market today equivalent with respect to quality and utility in formulating resins and paints? Yes....; No....."

Total number of replies: 40
Distribution of replies:

Yes	9
Yes	?(1)
No	26
?	1
No answer	3

A strong majority in the affirmative was expected in reply to this question. Since volatility was eliminated from consideration, compatibility, odor quality and odor stability are the only significant bases for variation among odorless thinners. Compatibility is set by hydrocarbon composition and since odorless thinners are composed only of paraffins, there can be no major differences among them with respect to compatibility. Odor quality and odor stability are left, and these are determined by refining procedure. Technology to refine odorless thinner is well established and, therefore, any producer of this material should be capable of refining to the same degree as any other producer. The replies to Question Number 8 suggest an indictment of the petroleum refiner, therefore, and it is suspected that this is aimed more at odor stability than at odor quality. Suffice it to say that if this is a just indictment, it should be brought to the immediate attention of the odorless thinner producer. Once he has been advised, he can take steps to eliminate any existing shortcomings of his product along the lines discussed herein.

Question Number 9

"By inserting the numbers, 1, 2 and 3 in the appropriate spaces rate the three types of interior decorative paints in decreasing order of quality with respect to the property set at the head of each column:

Ease of Application	Appearance
.. Odorless alkyd	.. Odorless alkyd
.. Conventional alkyd	.. Conventional alkyd
.. Emulsion (Latex)	.. Emulsion (Latex)
Abrasion Resistance	**Washability**
.. Odorless alkyd	.. Odorless alkyd
.. Conventional alkyd	.. Conventional alkyd
.. Emulsion (Latex)	.. Emulsion (Latex)

Total number of replies: 37

Distribution of replies:

Part 1 — Ease of Application

	Number of replies for each position			No answer
	1	2	3	
Odorless alkyd	4	19	6	8
Conventional alkyd	5	15	10	7
Emulsion (Latex)	27	1	4	5

It is suspected that the greater ease in spills- and after-cleanup of the water base paints was primarily influential in determining the distribution of replies on this point. Had the question been aimed at brushability and associated factors, it is believed that distribution of the replies might have been more even. It is quite certain, moreover, that all will agree that all three types of paints listed in Question Number 9 are well within the mastery of the amateur, "do-it-yourself," home decorator.

Part 2 — Appearance

	Number of replies for each position			No answer
	1	2	3	
Odorless alkyd	16	13	0	8
Conventional alkyd	24	5	1	7
Emulsion (Latex)	6	7	14	10

This set of replies presents a definite and interesting picture. Both types of alkyd oil base paints are rated superior to emulsion paints, and the odorless alkyd, despite its youthfulness is rated not too far behind the conventional alkyd paints. This may be taken as indicative of the rapid rate of development of the odorless alkyd paints.

Part 3 — Abrasion Resistance

	Number of replies for each position			No answer
	1	2	3	
Odorless alkyd	9	15	3	10
Conventional alkyd	24	4	2	7
Emulsion (Latex)	5	9	12	11

Again first place is definitely assigned to conventional alkyd paints, second place to odorless alkyds and third place to latex paints. And again there is marked evidence that odorless alkyds are making rapid strides to match the quality of the conventional alkyds.

Part 4 — Washability

	Number of replies for each position			No answer
	1	2	3	
Odorless alkyd	8	18	2	9
Conventional alkyd	23	6	2	6
Emulsion (Latex)	10	5	12	10

The same trend persists with respect to washability. It is probable that the No. 3 rating afforded to emulsion paints is associated with the initial aging period necessary for these coatings to attain ultimate quality.

As pointed out in the introductory remarks of this discussion, these relative ratings of conventional and odorless alkyd oil base paints are normal and reasonable. In view of the many problems re-posed by the odorless formulation which necessitate again going over the same ground once covered, it would be almost a suspicious circumstance if general opinion found that two brief years or so sufficed to develop the odorless systems to an equivalent or superior quality level relative to the conventional. In fact, such a report might well connote optimistic misrepresentation. On the other hand, the more reasonable report that up to one third of the formulators express confidence in the odorless systems at this early date ensures the ultimate general surpassing in quality of the conventional by the odorless. And it is significant that already majority opinion recognizes the superiority of the odorless formulations over the latex with respect to appearance, abrasion and washability.

(Question Number 10)

"In my opinion the most troublesome problem in formulating odorless, alkyd base paints is ——"

Total number of replies: 40

An interesting variety of replies was obtained to this question. Summarized, they ran as follows:

1. Seventeen replies advised that *insufficient solvency* is the most troublesome problem in formulating odorless, alkyd base paints.

This great majority was, of course, expected and stirs interest only in that this factor continues to retain stature. As the author has commented in other communications, the quality of current odorless paints despite the low compatibility characteristics of odorless thinners is a tribute to the ingenuities of the paint and resin formulators.

2. Seven replies selected *poor viscosity stability* as the most troublesome problem.

Table II

FILM DRYING STUDIES OF FLAT WALL PAINTS FORMULATED WITH HYDROCARBON THINNERS OF VARYING VOLATILITY AND COMPOSITION

(For basic formula of paint, see Table I)

Thinner[a]	ASTM Boiling Range, °F.	Hydrocarbon Composition, %wgt. P[b]	O[c]	N[d]	A[e]	Wet Edge Time, Minutes	Dry-To-Touch Time, Minutes
360 Solvent	310 - 355	68	1	31	0	GT[f] 5 - LT[g] 10	GT 15 - LT 20
Mineral Spirits	314 - 390	60	LT 1	22	18	GT 10 - LT 15	GT 20 - LT 25
Shell Sol 72 (Odorless)	345 - 404	ca. 100	–	–	–	GT 8 - LT 16	GT 40 - LT 48
140 Solvent	364 - 407	68	1	31	0	GT 24 - LT 32	GT 56 - LT 64
Kerosene	350 - 525	(Contained P, N and A.)				GT 90 - LT 120	GT 210 - LT 240

a All thinners were regularly marketed products of the Shell Oil Company
b Paraffins
c Olefins
d Naphthenes
e Aromatics
f Greater than
g Less than

This, of course, is but another criticism aimed at the poor compatibility features of odorless thinner. An expedient being employed on a steadily increasing scale is the use of additives such as those developed under the Shell Alkyd Reduction Technique.

3. Three replies advised that obtaining satisfactory *color or tint uniformity* is the most troublesome problem.

This might well be a problem of decreased pigment wetting power by the vehicle induced either by the redesign of the alkyd or through the reduced polarity associated with the odorless thinner as diluting medium. Again, an additive such as glyceryl mono-oleate merits consideration which acts as a pigment wetting agent and grinding aid.

4. Two replies held that maintenance of good *holdout* properties of the film is the most troublesome.

This problem should prove short-lived for the alkyds designed for odorless systems have, in general, been processed more closely to the gel point, and as a result, contribute better holdout properties to the paint film.

5. Two replies reported that the most troublesome problem in formulating odorless alkyd base paints to be the *lack of availability of odorless raw materials* such as vehicles, driers, anti-skinning agents, etc.

To some extent this is a valid criticism, and its mention might well have received greater attention through the questionnaire. Nevertheless, the problem has been and is continuing to be studied with considerable progress reportable already. Alkyds of reduced odor are available, driers have been improved in this respect and the recently announced epon ester vehicles for odorless coatings, developed by *Shell Chemical Corporation*, offer greater improvement along these lines.

6. One reply expressed the opinion that there is no troublesome problem associated with the formulation of odorless, alkyd base paints.

7. There were eight additional replies to Question Number 10 which are listed, although without comment, for the possible interest and information they may contain by implication. The most troublesome problem in formulating odorless alkyd base paints is:

a. ...obtaining the proper vehicle;
b. ...that they are not odorless;
c. ...that they exhibit too rapid set time and skinning;
d. ...the poor pigment wetting characteristics of odorless thinners;
e. ...their easy absorption of odor;
f. (Quoted directly) "...to get a satisfactory self-sealing odorless flat wall paint that may be recoated in 24 hours and still maintain satisfactory application characteristics equivalent to 'odorful' flats";
g. (Quoted directly) "...proper vehicle selection and pigmentation to get uniformity of film appearance"; and
h. (Quoted directly) "...to achieve uniformity of holdout and uniformity of color over porous surfaces without getting excessive viscosity due to the low solvency of odorless thinner".

Comments

As its conclusion the questionnaire invited the answerer to add any comments that he might care to make pertinent to the general subject. Four such comments were received and, similarly to the above, they are quoted directly on the basis of their potential interest and information:

a. "Would proprietary pigment products specially designed for easy and stable dispersion in odorless systems be of any value to the paint industry?"

Obviously, a representative of the petroleum industry is not one to answer this question. However, it is significant to note the implied interest and confidence of the pigment industry to produce materials designed to eliminate some of the problems cited previously in this discussion.

b. "Pigment flocculation is associated with low solvency. How can this be overcome without recourse to special additives?"

Lacking any data directly pertinent to this question, the author can only speculate. As has been pointed out earlier in this report, by nature of its synthesis, odorless thinner is restricted, compositionwise, to isoparaffinic hydrocarbons which are among the least polar of organic compounds. Any variation of this composition other than by what would be classed as "special additives" appears infeasible, at least at this time, because of odor quality limitations. Specific answer to this question is not at hand. However, there is a counter-question which may suggest a solution to the problem: cannot "special additives" be found which will control this flocculation without having adverse effects in other respects?

c. "The ceiling in the use of odorless thinners will be the *drying paint odor* which makes odorless alkyd wall paints more disagreeable than some latex paints."

As mentioned earlier herein, this problem is yielding to the attacks of the several raw materials industries.

d. "Another problem is that we cannot recommend an odorless thinner to our dealers for their customers. We have to recommend low odor thinner for safety. Customers would try to thin their regular paint products not formulated for the low solvency of odorless thinners—result kickout, loss of gloss, etc. Also the odorless thinners would not be too successful in brush cleaning."

The first point raised here resolves itself into a matter of consumer education and familiarity through use. After all, that familiar story is not too old of the professional painter who thinned his latex paint with mineral spirits! And solution to the second point is already in commercial practice—a small percentage of glyceryl mono-oleate in the odorless thinner produces an efficient brush cleaner.

Summary

With the information developed through the questionnaire covered, it remains to summarize the current status of odorless thinners and odorless paints. The odorless formulations permit for the first time the realization of the superior quality of alkyd paints completely free of solvent odor during application and drying. Marked additional improvements have been made in decreasing the odors associated with the oxidative and polymerization stages of film drying. Petroleum refining technology is established to assure an adequate supply of odorless thinner of practicably optimal quality as concerns odor quality, odor stability and volatility although realization of the last-named awaits more precise definition of the formulator's needs. Hydrocarbon composition essential to odor quality fixes the compatibility features of odorless thinners at relatively low levels. However, additives to augment solvency power have been successfully applied commercially and redesigned vehicles have been developed which are compatible with odorless thinners with no impairment and actual enhancement of other properties.

An intangible but nevertheless valuable contribution of the odorless development is the super-animation of technical development in the surface coatings industry, and as well the increased cooperative activities by this industry and the raw materials industries especially the petroleum industry. Of course, the basic barometer of the odorless development is the rate of sales to the paint and resin industries of odorless thinners. These sales, based on industry reports, have shown steady growth over the past two years, and over the past several months shown a rapidly accelerated growth sustained to the present.

News of Paint and Varnish Production Club Meetings

NEW YORK

Harold Davis, left, presenting the Nuodex Gavel to John Congleton, incoming New York president at the regular November meeting of the production club.

The last Technical Committee meeting of the New York Paint and Varnish Production Club was held at the "Brass Rail" on November 23, 1954, with 41 members, and 2 guests attending.

Technical Committee chairman Tony Skett congratulated Sub-Committee 53 for their work, which culminated in their winning first prize at the annual Federation meeting in Chicago. Ray Whitney, 53's chairman, in turn congratulated his co-workers on the committee, particularly Wally Hoback, of American Cyanamid, for his help in making the paper possible.

Open discussion was held regarding a proposed specification for mineral spirits, as proposed by the Philadelphia Club. The matter was referred to the Solvent Sub-Committee for study and comment at a future date. The Solvent Committee chairman reported on the progress being made on the study of the evaporation rates of solvents from paint or resinous coatings.

Chairman of the sub-committee on emülsion paints reported on the progress and difficulties being encountered in the studies of water vapor transmission measurements of three types of latex films. Discussion on this report offered the chairman several interesting suggestions on methods of test which might be applied to the latex films. The Advisory Committee chairman reported on their activities during the past month.

Following these reports the meeting was turned over to George Wormald of E. I. Dupont de Nemours who spoke on the blooming of Toluidine Reds. The talk was well illustrated with examples of conditions that cause blooming. The next meeting date was set for January 20, at the Brass Rail, 100 Park Ave. N. Y. C.

NEW ENGLAND

The regular meeting was called to order with seventy-five members and guests present.

As the first order of business, the following were elected to Class A membership: Karl E. Ackley, and William E. Spaulding, both of E. I. du Pont; Thomas W. Waters, Carpenter-Morton Co.; Joseph S. W. Parker, Sterling Paint & Varnish Co.; and Louis J. Meaney, Lou Meaney Co.

Committee reports were presented by the chairmen of the technical committee on Rheology and the standards and methods of test committee respectively. The latter committee plans to have a paper ready for presentation in the near future.

President Kelfer reported on the activities at the 32nd Annual Federation meeting. The chair announced that the New England Club paper, "A Report on a Study of Primers for Ferrous Metals in an Atmospheric Exposure," had tied for first prize for papers in the "practical" group classification and that the presentation of this paper had won the George B. Heckel first prize award. In appreciation of the efforts of committee chairman, H. Jerome, the club unanimously voted to return to him the American Paint Journal award.

Program chairman, A. Lukins, introduced George H. Eick of the Technical Sales Service Laboratory, Arizona Chemical, as guest speaker for the evening. Speaking on "Tall Oil in Protective Coating Vehicles," he outlined the manufacture of tall oil, covering the processing from pine tree through the recovery cycle at the digester blow tank. The reactions involved in the esterification of tall oil with various polyhydric alcohols was considered along with the calculations and computations involved. He closed his remarks with a discussion of the various vehicles made with tall oil and tall oil rosin and their respective properties.

PHILADELPHIA

Installation of new officers and a talk on "The Development of House Paints Pigmented With Titanium Pigments" were the highlights of the December meeting which was attended by 92 members and guests.

The officers for the coming year are as follows: President—Frank McNerney; Vice-President—David T. Nivin; Secretary—Emory Fleming; Treasurer—J. P. Snyder; and Assistant Treasurer—J. Sandeman. The traditional installation was made by Bill Werner after outgoing President, Jack Whiteway, gave his farewell address.

Frank Smith, manager of the Experimental Paint Test Station, Titanium Pigment Corp., Sayville, Long Island, traced the development of house paint formulations down through the years. He stressed particularly the introduction of titanium dioxide as a pigment and the latest formulations in which titanium dioxide is used as the sole hiding pigment to produce stain and fume resistant paints.

A report on the Federation Council Meeting in Chicago, November 17th, was given by John Harner, Club Council Representative.

Al Stover, chairman of the Technical Committee, reported progress on the Exterior Emulsion Paint Study and said that his committee had initiated another study on Anti-Skinning Agents.

The Plant Problems Committee said that a manual for management is being compiled to supplement the manual for employees.

C.D.I.C.

The 345th meeting of the C. D. I. C. club was held at Hotel Alms, Cincinnati, Ohio, on December 13, with 46 members and guests present.

The meeting was called to order by Vice President William L. Foy in the absence of President Robert Lipp.

In the absence of Elmer Moerschel, chairman of membership committee, the secretary gave the first reading on two Class A membership applications: Paul N. Valerius, Clopay Corporation, and Fred J. Bolle, Thresher Varnish Co., now - Pittsburgh Plate Glass Co.

The second reading was given to two Class A and one Class B membership applications, as: William Hagenbach, Irwin-Jewell & Vinson Co.; Walter M. Freelan, Moran Paint Co.; Helmuth Schoen, Battelle Memorial Inst.

It was moved and seconded that they be accepted for membership. The motion carried.

The previous month the Nominating Committee had placed the name of Robert Lipp before the group as candidate for Federation Council Representative. When there were no further nominations from the floor, it was moved and seconded that nominations be closed and that Mr. Lipp be elected by acclamation. The motion carried.

Bill Kentner gave a brief report on the things that had transpired at the recent Federation Council Meeting.

The secretary read a letter of invitation from Chairman Zettlemoyer—Division of Paint Chemistry—American Chemical Society.

Mr. Foy informed the Club that

(*Turn to page 66*)

NEWS

Specialists Discuss Agricultural Products in Protective Coatings

Specialists in research related to protective coatings met recently at the USDA Southern Regional Research Laboratory at New Orleans, La., for the third meeting of the Informal Research Committee of the Protective Coatings Industry. The purpose of the meeting was to bring together scientists from government and industry to discuss current problems and new developments relating to use of agricultural products in protective coatings.

Members of the Eastern, Northern and Southern Research Branches reviewed progress in research of interest to the protective coatings industry. William S. Port, Eastern Branch, opened the session with a discussion of the use of fat derivatives in vinyl polymers, dwelling particularly on copolymers of vinylstearate and vinyl chloride. Herbert J. Dutton, Northern Branch, followed with an account of the application of an automatic countercurrent distribution apparatus to the glyceride structure of linseed oil and to the low temperature decomposition of linoleate hydroperoxide. L. A. Goldblatt, Southern Branch, discussed some Diels-Alder reactions of tung oil. Ray V. Lawrence, Southern Branch, told of new rosin derivatives.

On the second day Wayne R. Fuller, Grand Rapids Varnish Corp., gave an account of the use of agricultural products in surface coatings. Paul Stamberger, Calverton Chemical Corp., spoke on fundamental colloidal concepts applied to the water base paint field and presented considerable information on the theory of emulsions used in protective coatings. John A. Gordon, Jr., Monsanto Chemical Co., discussed some new developments in surface coatings dealing with the use of acrylonitrile.

Francis Scofield, National Paint, Varnish, and Lacquer Association, Washington, D. C., is the Chairman of the Committee.

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B. E. Dougherty Co. West Coast Distributor for Acheson Pigments

Acheson Dispersed Pigments Co. of Philadelphia, manufacturers of pigment dispersions for the plastics and printing ink industries, has announced the appointment of the B. E. Dougherty Co., Los Angeles, and San Francisco, to handle sales of its products in the West Coast area.

Protective Coatings Specialists Meet

Meeting in New Orleans were, front row, left to right, John A. Gordon, Jr., Monsanto Chemical Co.; J. C. Pedarre, Jr., The Glidden Co.; Wm. S. Port, Eastern Utilization Research Branch; R. L. Terrill, Spencer Kellogg & Sons, Inc.; C. H. Fisher, Chief, Southern Utilization Research Branch. Second row, Wayne R. Fuller, Grand Rapids Varnish Corp.; Don S. Bolley, The Baker Castor Oil Co.; Paul Stamberger, Calverton Chemical Corp.; H. J. Dutton, Northern Utilization Research Branch; Ray V. Lawrence, and L. A. Goldblatt, Southern Utilization Research Branch. Third row, Francis Scofield, National Paint, Varnish, and Lacquer Association; F. G. Dollear, and A. M. Altschul, Southern Utilization Research Branch. This was the group's third meeting.

Devoe & Raynolds Move Executive Offices to Louisville, Kentucky

William C. Dabney, president of Devoe & Raynolds Co. Inc., has announced that on January 3, 1955, the executive offices of Devoe & Raynolds will be moved from New York City to Louisville, Ky. He said that a thorough survey proved that concentrating the executive offices in Louisville—where Devoe operates two large plants and maintains research and development headquarters for the entire company—would effect substantial savings and greatly increase operating efficiencies.

Devoe & Raynolds will occupy the first floor of the Columbia Building in Louisville. The Eastern District Sales Office, Eastern District Credit Office and Eastern District Order and Billing Office will remain in New York City. Approximately fifty executives and supervisory people will move to Louisville and approximately 150 people will be employed in the area to staff these new offices.

Announcement has also been made of the election of Doran S. Weinstein as executive vice president and assistant to the president. He will make his headquarters in Louisville.

Four promotions from within the organization have also been announced.

J. C. Knochel will assume over-all management responsibilities as a vice president at the Louisville executive offices.

Basis Howell, will become president of Truscon Laboratories Div., Detroit.

J. F. MacCallum becomes general production manager of Devoe; and Bulow W. Dysart was promoted to plant manager of the Jones-Dabney Div.

•

Surface Technology Courses Set For Spring at New York University

Two courses in surface technology will be offered during the 1955 spring term at New York University's Division of General Education, Dean Paul A. McGhee has announced.

"Fundamentals of Paint, Varnish, and Lacquer Technology" will include discussion of coatings for protection, decoration, and functional purposes; raw materials used in organic coating; manufacture of organic finishes; finishes from the user's standpoint; and testing methods.

Instructors for the course will be Dr. Myron A. Coler, adjunct professor and consultant in technical studies at NYU, and Elias Singer, technical director, Troy Chemical Co., New York City. Dr. Coler also is technical director of the Markite Co., New York City.

The Division of General Education also will conduct a seminar on "New Developments in Organic Finishes." Lecturers will be Dr. Coler, Mr. Singer, and Sidney Lauren, research chemist with the Johns-Manville Corporation.

Some of the subjects to be discussed during the seminar are new binder materials, new pigmentary materials, and the requirements for finishes set forth by the special agencies of the military establishments.

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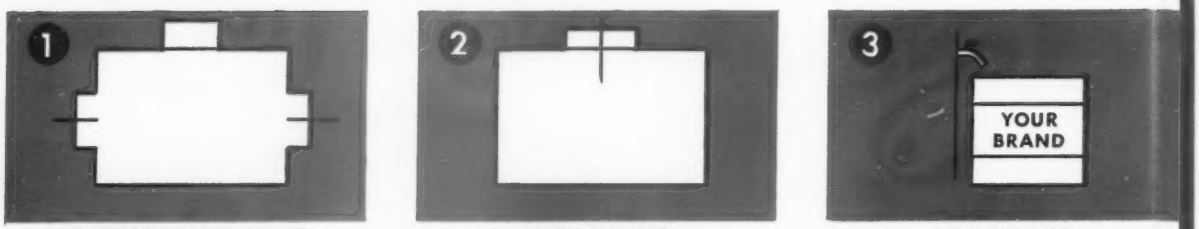

DISPERSE PIGMENT — MIX PAINT — PACKAGE

Here's a new emulsion vehicle for flat interior wall paints that will cut your production costs—and make it easy for you to manufacture latex-base paints *in just three steps!*

This new Cargill vehicle is EVT-50—a *complete* vehicle of the modified synthetic latex type. You make paint simply by (1) pigment dispersion (2) mixing (3) packaging. You cut production time by as much as 60%!

With Cargill EVT-50 you can manufacture a superior flat paint on standard plant equipment just as easily as you now make conventional oil-based paint. Costly and troublesome steps are eliminated!

Cargill EVT-50 was developed to meet your demand for a stable, total vehicle. If you've had production and quality control problems in your plant, Cargill EVT-50 will help you solve them by eliminating many critical processes. Because Cargill EVT-50 is a stable, *uniform* vehicle with controlled particle size, you can manufacture paint of *consistently uniform quality* . . . every batch the same.

And, Cargill EVT-50 contains *both* synthetic latex and oleoresinous polymers—balanced to give you the best properties of each.

With this complete vehicle you can turn out a *better* interior paint, with amazing durability and adhesion on all interior surfaces, including wood. When dry, the film is more permeable to water vapor than conventional latex-base paints.

When you use Cargill EVT-50, you can turn out *more* paint. And quality control is simplified by reducing the number of production steps. You can reduce your inventory of raw materials, handling fewer ingredients. When you use EVT-50, equipment can be cleaned quickly and easily with water—no gummy residues to clog or adhere to your equipment.

Ask your Cargill Representative for complete information on EVT-50—or send in the handy coupon at right. If you wish, a Cargill Technical Representative will be glad to help you try EVT-50 in your own plant, using your equipment.

PROPERTIES OF CARGILL EVT-50

Appearance	Opaque White
Solids (non-volatile)	46% + or — 1
Volatile	Predominantly Water
Weight per gallon	Theoretical 8.3-8.4 lbs.
	Apparent 7.5 lbs.
pH	Approximately 9.0
Viscosity	110-130 K.U.
Stability	
Mechanical	Excellent
Freeze-Thaw	Excellent

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Conventional Latex Method	EVT-50 Method
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• Dissolve Preservative	• Mix
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• Grind Pigment	
• Mix	
• Package	You eliminate 4 steps!

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NEWS

L. H. Flett

L. H. Flett Retires; Will Serve National Aniline as Consultant

Lawrence H. Flett who has been with National Aniline Div. of Allied Chemical & Dye Corp. for thirty-five years has retired, for reasons of health, from full time active service. He will continue to serve the company as a consultant.

For the past twelve years Mr. Flett has been director of National's New Products Div. and prior to that served in various capacities in research and operations. He has made many notable contributions in the chemical field, and the development of synthetic detergents in the United States is largely based on work which he pioneered. He holds about 75 patents in the field of chemistry and is the author of many publications and co-author of a number of books, the most recent of which is "Maleic Anhydride Derivatives."

Mr. Flett has been active in the American Chemical Society. He has served on the advisory boards of *Industrial & Engineering Chemistry* and *Chemical & Engineering News*, and is currently the chairman-elect of the Division of Chemical Marketing and Economics and chairman of the Canvassing committee for the Precision Scientific Company Award. He was awarded the Schoellkopf Medal in 1942, and is past president of the American Institute of Chemists and of the Chemical Market Research Association. He was one of the group that re-established the Gordon Research Conferences at New London, N. H., and has been an active participant from the start. He is currently a contributing editor of *The Chemist*.

Mr. Flett resides at 15 Beechwood Lane, Scarsdale, N. Y.

Container Practice Revised; Submitted for Acceptance

A revision of Simplified Practice Recommendation R144-49, Paints, Varnishes, and related Products (Colors and Containers), proposed by the Simplification Committee of the National Paint, Varnish and Lacquer Association, and approved by the recommendation's standing committee, has been submitted to producers, distributors, users, and others interested for acceptance and comment, according to a report of the Commodity Standards Division, Office of Technical Services, U. S. Department of Commerce.

This recommendation gives a maximum number of colors and sizes of container for a variety of oil paints, enamels, varnishes, water-thinned paints and related products. It covers trade sales items only. It was first issued in 1924 as a Limitation of Variety Recommendation, and in 1932 was converted to a Simplified Practice Recommendation. It was revised in 1937, 1939, 1941, 1943, 1945, and 1949.

The purpose of the revision is to bring the recommendation in line with current needs and industry practice. The proposed changes provide for an increase in the recommended maximum number of colors of six items of oil paints and related products, and four items of water-thinned paints and related products. The description of several of the items has been clarified as has the explanatory footnotes for certain items.

Mimeographed copies may be obtained from the Commodity Standards Division, Office of Technical Services, U. S. Department of Commerce, Washing 25, D. C.

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Farnow Varnish Works Changes Firm Name to Farnow, Inc.

Farnow Varnish Works of Long Island City, N. Y. has announced a change in firm name to Farnow, Inc.

Benjamin Farber, treasurer of the New York Paint, Varnish and Lacquer Association, has been elected president of the firm. Moe Bauman will be in charge of production and research, and Herman Kristeller in charge of sales.

•

ASTM to Hold Committee Week In Cincinnati, Jan. 31 to Feb. 4

The American Society for Testing Materials will hold its annual Committee Week Jan. 31 to Feb. 4 at Cincinnati, Ohio.

Headquarters for the meeting will be the Netherland Plaza Hotel. Arrangements have also been made with the Terrace Plaza, the Sheraton-Gibson, and the Sinton Hotels for additional rooms to accommodate the large number of members and visitors.

100th Nuodex Gavel Presented At Philadelphia Production Club

The 100th Nuodex Gavel was presented at the Dec. 15th meeting of the Phildelphia Production Club to incoming president Frank McNerney, technical director of Yarnall Paint Co.

Harry Gaffney (l) and Frank McNerney.

The presentation was made by Harry Gaffney, Nuodex sales representative in the Philadelphia area.

The tradition of the Nuodex Gavel was initiated in 1949, and since then, the engraved, silver banded gavels have been calling meetings to order in every Production Club in the Federation.

Prior to assuming the presidency, McNerney was vice president and chairman of the program committee. He is also a member of the technical and executive committees.

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Hercules Powder Co. Consolidates Facilities at Hopewell, Virginia

Consolidation of two Hercules Powder Co. facilities at Hopewell, Va., and the appointment of Floyd L. Boddicker as manager of the combined plant, was announced by Edward G. Crum, general manager of the company's Virginia Cellulose Dept. The combined plant will be operated by the Virginia Cellulose Dept.

At the same time, it was announced that the manufacture and research, involving CMC (sodium carboxymethylcellulose) and ethyl cellulose, will be handled by the Virginia Cellulose Dept. Sale of CMC will also be handled by Virginia Cellulose, while the sale of ethyl cellulose will continue to be handled by the Cellulose Products Dept.

Also announced was the appointment of Orval J. Hand and Frederick J. Bouchard as superintendents at the Hopewell plant. Mr. Hand will be primarily concerned with the chemical cotton and caustic chlorine facilities, while Mr. Bouchard will be responsible for CMC, ethyl cellulose, and related facilities.

NEWS

Paint Increase Seen for 1955; "Do-It-Yourself" Trend is Factor

Paint manufacturers are looking forward to increased volume in 1955, with expectations of over-the-counter trade paint sales ranging from 3 to 5 per cent above those for last year.

According to Douglas C. Arnold, president of the New York Paint, Varnish and Lacquer Association, and head of Keystone Paint and Varnish Corp. of Brooklyn, N. Y., the anticipated improvement stems, in large part, from the tremendous growth and popularity of the "do-it-yourself" trend.

New paint and paint products developed by the industry have aimed at easier application, better color selection, more odorless paints, and quicker drying, more washable products. These have been strong incentives to the "do-it-yourselfer," making it easy for the housewife or handyman to do a professional-looking job.

Says Mr. Arnold, "The master painter no longer is resisting the 'do-it-yourself' movement. He has joined it. Master painters now offer to do the bigger jobs on the house, such as the upper parts, the gutters, the leaders, gables, etc., while the less-experienced householder is left to do the easily accessible places. As a result of his cooperation with the home owner, most master painters now are reported so busy with fulltime plus part-house work they are not finding it easy to fit new jobs into their overcrowded work schedules."

The "do-it-yourself" movement has also received a boost from the growing number of illustrated articles in magazines which have devoted more and more space to such features. Periodicals such as Mechanix Illustrated, Coronet, and American Magazine are featuring regular how-to-paint picture stories where none or one a year appeared hitherto.

The gains in new home building and personal savings also are important in the more confident general business trend, according to Mr. Arnold.

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Davis & Davis to Represent Midland Chemical in Mid-West

Midland Chemical Corp. of Dayton Ohio, has announced the appointment of Davis & Davis, Chicago, Ill., as manufacturer's representatives serving that area on matters dealing with special vehicles, resins, and "Dextran Chemicals" recently announced by Midland.

First unit of Columbian Carbon's Louisiana plant goes into operation.

Columbian Carbon Co. Expands Production of Carbon Black

New capacity for producing 20 million pounds of carbon black annually was started when Columbian Carbon Co. put into operation the first unit of its North Bend plant in St. Mary Parish, near Franklin, Louisiana. When construction is completed toward the close of 1955, the output of the three units of this plant will reach an estimated 60 million pounds annually.

Some idea of the importance of carbon black manufacture can be had when it is realized that over 11 million pounds are required annually to reinforce and fortify paint films to protect property, machinery, equipment, and industrial production facilities from corrosion and deterioration.

Carbon black operations of the Columbian Carbon Co. and subsidiaries include 14 other plants located in Louisiana, Texas, Arkansas, New Mexico and Kansas. Important factors in attracting the new plant to its location on the Intracoastal Waterway in St. Mary Parish were availability of gas from nearby sources, flexibility of raw material supply through use of barge transportation, and the favorable attitude of local citizens to industry.

T. J. McDowell Feted For Long Service to Sherwin-Williams Co.

Thomas J. McDowell, general counsel for The Sherwin-Williams Co., was honored, on Dec. 1st; by members of his staff upon completion of 25 years service with the paint firm.

A native Clevelander, McDowell won his law degree from Cleveland Law School in 1928. After a brief period with the Central National Bank of Cleveland, he joined Sherwin-Williams and was instrumental in establishing the company's Legal Department. He assumed his present post in 1942.

Mr. and Mrs. McDowell have two sons, James who is now serving with the U. S. Army, and Timothy who is associated with a Cleveland realty company.

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Fundamentals of Drying to Be Discussed at Chemical Conference

The 5th Divisional Conference of the Chemical Engineering Division, The Chemical Institute of Canada, will be held March 7-9, in Ottawa, Ont. Upwards of 300 chemical engineers and industrial chemists are expected to attend.

The conference, under the chairmanship of Dr. Paul E. Gishler, will include two days of technical papers, one half-day of which will be devoted to the fundamentals of drying.

Morrison Retires; Jennings New Hercules Manager at Parlin, N. J.

William H. Morrison, manager of Hercules Powder Company's plant at Parlin, New Jersey, since November, 1947, will retire from service at the end of this month, it has been announced by the company.

Mr. Morrison will be succeeded as plant manager by Earp F. Jennings, Jr., who has been assistant manager at Parlin since April 1, 1953.

Mr. Morrison joined Hercules in 1934 as a project engineer at the Parlin plant. From 1940 to 1943, he was nitrocellulose superintendent at the Hercules-operated government-owned Radford Ordnance Works in Virginia and the Badger Ordnance Works in Wisconsin.

He returned to Parlin in 1943 and was named nitrocellulose superintendent. He became assistant plant manager in August, 1944, and manager three years later.

Mr. Jennings joined Hercules at Parlin as a research chemist in 1939, and has remained there in various supervisory posts ever since.

In recent years, he has served as assistant to the plant manager, assistant mechanical superintendent, and superintendent of the Acid Department before his appointment as assistant plant manager in 1953.

NEWS

Industries Using Chemicals to Be Noted at Plant Maintenance Show

Factory maintenance in industries dealing with chemicals will get special attention at the Plant Maintenance & Engineering Conference Jan. 24-27. The show will be held at the International Amphitheatre in Chicago.

Two roundtable sessions will be devoted exclusively to maintenance in chemical plants. Among other topics, of special interest, are "Corrosion Control and Prevention," "Safety, Protection and Fire Prevention," and "Lubrication."

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Continental Can Co. Appoints New Vice Presidents; Control Officer

Continental Can Company's board of directors has elected Lawrence Wilkinson group vice president and Charles B. Stauffacher vice president in charge of finance, it was announced by General Lucius D. Clay, chairman of the board.

Mr. Wilkinson, who has served as vice president in charge of finance since 1952, will, in his new capacity, direct the activities of the company's fibre drum, paper container, flexible packaging and crown and cork divisions.

Mr. Stauffacher has been control officer of Continental since 1952. Raben C. Schenk has been named acting control officer. He formerly was assistant to the vice president of the company's paper container division at Newark.

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Du Pont Finishes Div. Creates Insulation Sales and Service Dept.

The Du Pont Company's Finishes Division has created an insulation sales and service organization. Fred J. Emig is manager, and will be assisted by Stanley F. Gruen and George P. Mell as sales and service representatives.

Mr. Emig and Mr. Gruen will have their headquarters with the company's industrial finishes sales group in Chicago, and Mr. Mell in Philadelphia. Among the products they will handle are Du Pont's new water-borne wire enamels, "Lecton" acrylic resin wire enamel and "Teflon" tetrafluoroethylene resin wire enamel. They will also handle the more standard types, such as nylon and "Formvar" wire enamels, as well as orthodox wire enamels and insulating varnish type materials.

The Chemical Specialties Manufacturers' Association Achievement Award given at the group's 41st annual meeting in New York City on December 7. Honored for their World War II work on aerosol insecticides were Dr. Lyle D. Goodhue of Bartlesville, Okla., (right), and William N. Sullivan, Jr., (center). H. R. Shephard, chairman of the national association's aerosol division, (left), presented the awards. Goodhue and Sullivan developed a practical aerosol insecticide, using a liquefied gas as the propellent, to combat the disease-carrying insects that were seriously plaguing U. S. servicemen at overseas bases.

Reorganization Announced By Hercules Naval Stores Department

Reorganization of Hercules Powder Company's Naval Stores Dept., to provide two assistant general managers and three new divisions and division managers, was announced by Paul Mayfield, department general manager.

Arthur Langmeier, assistant general manager of Naval Stores since 1952, will be responsible for production and development. G. Fred Hogg, newly-appointed assistant general manager, will be responsible for sales under the reorganization plan.

The three new divisions are:

Agricultural Chemicals Div., Richard T. Yates, manager; Pine Chemicals Div., H. M. Wendle, manager; Oxychemicals Div., Donald H. Sheffield, manager.

Mr. Mayfield also announced that the positions of director of sales and assistant directors of sales in his department will be eliminated. Dr. R. S. George will become director of development under the reorganization, reporting to Mr. Langmeier.

Also announced was a new plant to be put into operation this month when the Higgins Plant at Gibbstown, N. J., begins the production of synthetic phenol and acetone.

The Paints and Varnishes Division committee of the 1955 Greater New York Campaign of the National Foundation for Infantile Paralysis as they met to make plans to do their part in the $4,000,000 citywide drive. Seated with the chairman, Louis Gillespie, president of Gillespie-Rogers-Pyatt Co., (second from right), are l. to r. Douglas C. Arnold, Keystone Varnish Co.; M. H. Corbin, Standard Toch Chemical Co., and H. B. Woodman, Interchemical Corp. Standing l. to r. are Neil A. Brady, Brady-Palmer Printing Co.; Martin Wile, Stevens Paint Co.; Paul L. Kohnstamm, H. Kohnstamm & Co.; Charles Freedman, Mantrose Corp.; Reginald C. Pye, J. Lee Smith Co.; Al Calo, John H. Calo Co., and David S. Lifson, 20th Century Paint & Varnish Corp. Members not present are T. V. Birmingham, Sapolin Co.; T. D. Celenza, National Paint Co., and Harold L. Jungmann, Titanium Pigment Corp. The meeting was held at the Yale Club.

NEWS

Cargill Opens Boston Linseed Sales Office; J. K. Yarger Manager

Cargill, Inc. has recently announced the opening of a linseed oil sales office in Boston. The announcement was made by Fred Seed, vice president of the company.

J. K. Yarger

John K. Yarger will manage the new office which will be located in the Grain and Flour Exchange Building. Mr. Yarger, who has just returned from a two-year tour of duty with the Navy, is a graduate of the University of Minnesota. He joined the company's Oil Division in 1951.

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Elliot S. Phillips Retires, Former President of Devoe Co.

Elliot S. Phillips, for 26 years, until 1951, president of the Devoe Co., has retired it has been announced by W. C. Dabney, President of Devoe & Raynolds Co.

Mr. Phillips has been associated with the Devoe Company for 39 years. He has been on the Board of Directors since 1921 and was Chairman of the Board and the Executive Committee for many years.

Mr. Phillips learned the paint business from the ranks, joining the company after graduation from Yale University. He was a Naval Aviation Officer in World War I and upon his return he advanced steadily from a salesman in the New York Fulton St. store, to territory salesman, to factory superintendent. He became a Vice President in 1921, General Manager in 1923, and was elected President in 1924 when E. H. Raynolds retired.

Under Mr. Phillips' management, Devoe's present group of subsidiaries was acquired and sales multiplied sevenfold.

He has been active in numerous paint industry associations, having served as President of the Paint Manufacturers' Association and as a member of its Educational Bureau and Executive Committee for many years. He was the first Chairman of the Executive Committee of the National Paint, Varnish & Lacquer Association upon its merger with the Paint Manufacturer's Association in 1953.

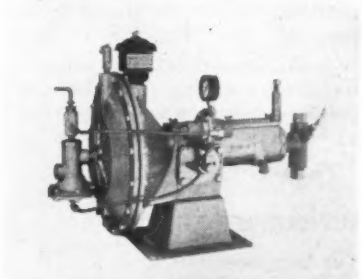
NEW MATERIALS & EQUIPMENT

A MONTHLY MARKET SURVEY

This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.

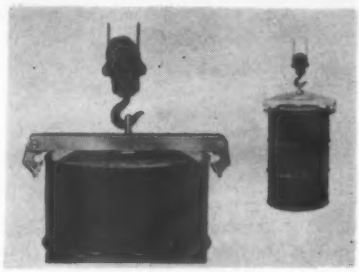
PUMPS
Reciprocating Types

Positive displacement, reciprocating type pumps used for chemical injection, proportioning, pressure lubrication and fluid transfer, are claimed to handle all types of aqueous solutions and liquid lubricants and, in their various types, to inject or proportion additives into lines or vessels carrying as much as 30,000 psi pressure. The "Type MSM Pump" is operated



TEXSTEAM

by air or gas pressure and said to provide discharge ratios up to 497/1. Manufacturer says this pump can be regulated to inject additives in exact proportions to the volumes carried in lines or vessels. Frame and body are of high strength aluminum alloy. The pump mechanism is regularly made of stainless steel, with other materials furnished on special order. The pump operates in an oil bath, is said to be sealed against dust and atmospheric influences, and is equipped with external controls. Other types include high volume transfer pumps, electrically-operated high pressure and high volume injector and proportioning pumps, and high pressure injector pumps that are operated by rocker arms or reciprocating beams. Texsteam Corp., P.O. Box 9127 Houston, Texas.



PALMER—SHILE

DRUM LIFTER
Vertical Type

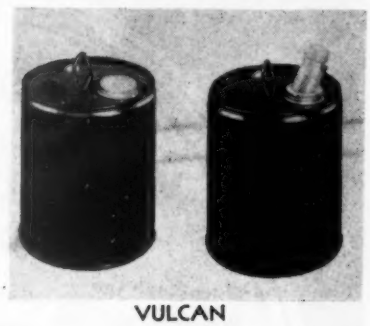
Vertical drum lifter to handle open and closed steel drums in vertical position, by crane or hoist, is of all-steel welded construction. It is claimed to have a sure-hold safety barrel grip. Palmer-Shile Co., 12622 Mansfield, Detroit 27, Mich.

COMPUTING COUNTER
Electronic Type

"Model 25 Flow Digitizer" is a computing electronic counter which converts the digital output of the Potter Flow Sensing Element to gallons, pounds or other desired units of flow. The counter and computing system are said to have an inherent accuracy of .05 of 1%. In combination, this is said to produce a system capable of measuring total flow with an accuracy of ± ½% over wide ranges and an accuracy as high as ± 1/10% at fairly constant flow rates. The computing circuit consists of eleven magnetic binary dividers with an output pulse selection system which enables the user to obtain any number of counts from 1 to 2047 for 2048 input pulses from the sensing element. Total flow is indicated on a six-digit mechanical register and on two decade-counting glow-transfer counting tubes. A single count may represent as little as .0001 gallon or more than a gallon, depending on the size of the sensing element used. Potter Aeronautical Co., Route 22, Union, N. J.

1-GALLON DRUM
Chemical Resistant Lining

A 1-gallon tight head drum is claimed to incorporate all the up-to-date features of standard-size containers It is said to meet the demand for shipment of products where smaller quantities are required as in agriculture, laboratories or numerous departments within a company. Manufacturer says the drum is a sturdy, standard ICC-17E container, round in shape



VULCAN

with welded side seams and double-seamed ends. The top is necked in to provide for convenient stable stacking, and has a carrying handle and recessed 45mm screw cap. The interior of the drum is claimed to have a non-toxic, chemical resistant hi-bake lining, with additional interior linings supplied upon individual requirements. Vulcan Stamping and Mfg. Co., P.O. Box 161, Bellwood, Ill.

PAINT CONDITIONER
Reduces Time

A new type clamp enables the company's heavy duty "No. 33 Paint Conditioner" to shake paint by the carton as well as by the can. Manufacturer says that by shaking up to four 1-gal. cans at a time, the "No. 33" cuts paint-conditioning time several hundred per cent, particularly for such large-scale handlers of paint as paint factories, distributors and dealers, contractors, shipyards, body painters, etc. Red Devil Tools, Irvington, N. J.

NEW MATERIALS — EQUIPMENT

CHROMOMETER

Meets ASTM Specifications

Company says that their "Fisher/Tag Saybolt Chromometer introduced a revolving turret head for color comparison discs, eliminating the awkward time-consuming one-at-a-time changes of color discs necessary in older models. All the operator has to do, the company reports, is put his color standard discs (manufactured by the company according to ASTM specifications in one-half, one, and two-units) into the revolving turret; rotate each in turn under the tube; draw down his sample

FISHER

in the graduated tube until he finds a match in the divided field viewer. Now the company makes available a new Quarter Standard Color Disc for matching the lightest tint in the purest of color ranges—a permanent glass disc in the "plus 30" Saybolt Chromometer Shade. This new sensitivity in the practically colorless ranges is expected to prove handy in the vast field of vegetable oils and refined syrups; heretofore difficult-to-measure "off-whites" are claimed to be permanently recorded in the company's color shade. Fisher Scientific Co., 717 Forbes St., Pittsburgh, Pa.

FLOW METER

Remote Reading

The "Xactronic" meter is claimed to be accurate, compact, easy to clean, flexible, simple, because of no moving parts in the metering element, and capable of remote reading. Company says the meter has a rated accuracy of plus or minus 1 per cent of the full scale reading and claims that changes in liquid viscosity, density, temperature, flow velocity, or variation in line voltage will not affect its rated accuracy. The meter comes in six sizes, ½", ¾", 1", 1¼", 1½", and 2". Bowser, Inc., Fort Wayne, Ind.

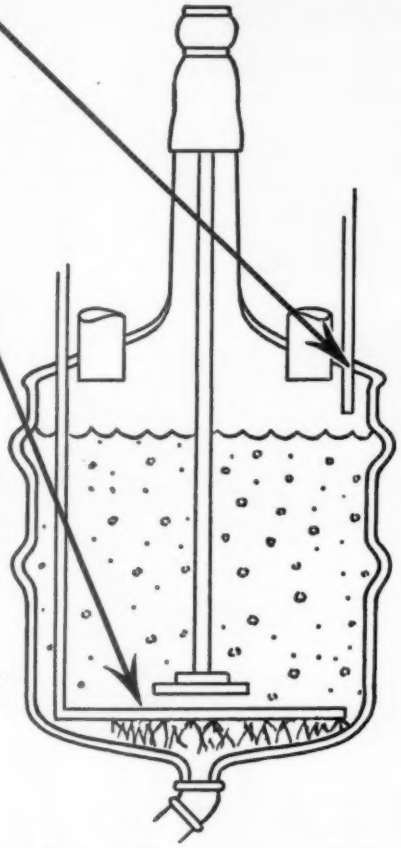
GLYCOL ETHERS

For Lacquers

Introduced are two glycol ether solvents and intermediates "Dowanol 8" (ethelene glycol ethyl ether), is a resin solvent used extensively in lacquer, dye and ink formulations. It is also an intermediate in the production of plasticizers. "Dowanol 17" (diethylene glycol ethyl ether), is said to be useful as a lacquer solvent and is also an intermediate in the production of phthalic plasticizers. Both materials are claimed to be colorless liquids with mild pleasant odors. As solvents for hydrophobic and hydrophilic materials, they are useful for mixtures containing water and water insoluble organic chemicals. Plasticizers, solvent vehicles and other derivatives can be made by reacting either product with fatty acids, acetic anhydride or phthalic acid. The Dow Chemical Co., Midland Mich.

CO_2 injected in top of cooking kettle forms an effective atmospheric blanket which guards against fire and explosion.

When sparged through cooking kettles, CO_2 gas keeps color light, prevents oxidation, aids agitation, absorbs moisture and speeds reaction.



ACTUAL TESTS PROVE

CO_2 CUTS OIL COOKING TIME 2/3!

Actual tests conducted in the laboratories of a major manufacturer* produced these conclusive findings:

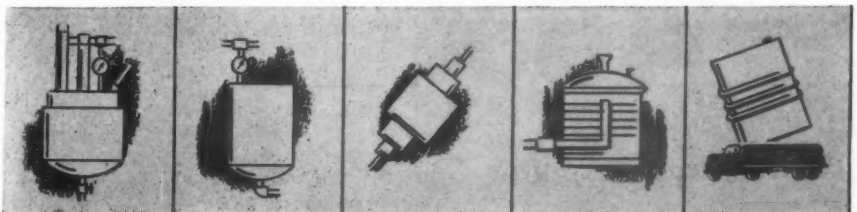
CO_2 sparging, added to conventional mechanical agitation, cut cooking time from 720 to 235 minutes! To achieve this remarkable saving, CO_2 functioned in 2 important ways—

1. **Sparged up through the mixture, CO_2** markedly increased agitation, causing faster, more even cooking.
2. **Water is "swept" away.** Passing up through the mixture, the CO_2 bubbles absorbed water vapor from the product—allowing the mixture to reach the desired cooking temperature sooner.

Tests Verify Another Important Fact — CO_2, when sparged through the reaction mixture, inerts it—effectively inhibits oxidation—color stays desireably light and constant

*Name on request

OTHER WAYS A LIQUIFLOW† CO_2 SYSTEM CUTS COSTS IN THE PAINT PLANT



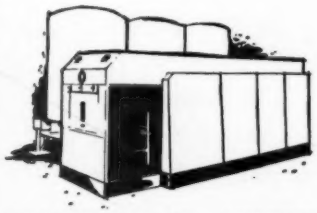
thinning
CO_2 in thinning tank retards oxidation, provides a fireproof "blanket".

storage
CO_2 "blanket" in storage tank prevents "skinning."

transfer
Under pressure from the Liquiflow† System, CO_2 is a safe, efficient transfer medium.

filtration
CO_2 used to purge filters recovers the oil, reduces cleaning time and frequency of cleanings.

packaging & transport
Inerting with CO_2 prevents "skinning", eliminates costly cleanouts.



†LIQUIFLOW CO_2 SYSTEM
Manufactured by The Liquid Carbonic Corporation. This unit assures a constant supply of chemically pure CO_2 anywhere in your plant. Let experienced LIQUID engineers show you how an integrated Liquiflow CO_2 System will improve your product and lower your operating costs.

FREE MANUAL *"The Uses of CO_2 in Paint Manufacturing"*

THE LIQUID CARBONIC CORPORATION
3128 South Kedzie Avenue • Chicago 23, Illinois

Liquid

Please send me the new manual, "The Uses of CO_2 in Paint, Varnish and Other Alkyd-Type Resin Manufacturing."

NAME_____

COMPANY NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

It's a snap

. . . to prove that
Dutch Boy Basic Silicate White Lead* **"45X"**
has what it takes
to make foolproof exterior paints

If you want to cut complaints on your exterior paints, use "lead."

Specifically, "Dutch Boy" Basic Silicate White Lead "45X"—if you'll take a tip from leading paint makers and learn more about "lead" in its most economical form.

Their widespread use of "45X" proves that it has what it takes to make foolproof exterior paints. And exposure tests at National Lead's Sayville Test Station—where many different pigments have been exposed for many years — pin this proof down scientifically.

In white House Paints, "Dutch Boy" Basic Silicate White Lead "45X" improves self-cleaning properties.

In tinted House Paints, it increases film durability and resistance to color changes.

In Primers, "45X" contributes greater adhesion, plus the water resistance to maintain the paint film's adhesive bond.

In Porch and Floor Enamels, it plasticizes the film, increases abrasion resistance, improves adhesion.

For all its adaptability, you use fewer pounds of "45X" than of other white lead types. That's because the reactive portion of each "45X" pigment particle is concentrated at the surface and, thus, proportionately larger amounts of "lead" are made available.

It's a snap to improve exterior paints with "Dutch Boy" Basic Silicate White Lead "45X." Try it in your formulations.

National Lead Company: New York 6; Atlanta; Buffalo 3; Chicago 80; Cincinnati 3; Cleveland 13; Dallas 2; Philadelphia 25; Pittsburgh 12; St. Louis 1; San Francisco 10; Boston 6 (National Lead Co. of Mass.). *Reg. U. S. Pat. Off.

NEW MATERIALS — EQUIPMENT

PORCELAIN JAR
For Lab Mills

A one-gallon porcelain laboratory jar, No. PRU-IG, for use on roller-type laboratory ball mills is said to have all of the bronze hardware recessed to prevent any catching, grabbing or holding while the jar is being revolved on the mill. The jar is claimed to have a tough, long-wearing ceramic body

McDANEL

of the highest grade and the lid is said to lock securely in place sealing the jar with either a rubber or a neoprene gasket. The jar is available at laboratory supply houses or from McDanel Refractory Porcelain Co., Beaver Falls, Pa.

LACQUER SOLVENT
Improves Blush Resistance

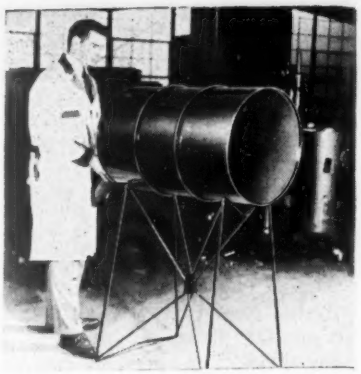
"Pentasol 258" has been developed specifically for use in nitrocellulose lacquer. It is the latent solvent counterpart of the company's "Amyl Acetate 280," and is recommended, by the company, to be used in conjunction with the latter or other solvents of this general type. The new solvent has a Color of Water White and a Flash Point (open cup) of 75°F. Sharples Chemicals Inc., Philadelphia, Pa.

AEROSOL PRESSURE FILLER
Stainless Steel Construction

Manufacturer claims that this aerosol pressure filler has a stainless steel construction. Other features claimed are a base 12" x 10", height adjustment 3" to 11" for different size cans, safety glass in front of pyrex glass burettes, movable portion of device spring balanced. Builders Sheet Metal Works Inc., 108 Wooster St., New York 12, N. Y.

DRUM RACK
Steel Welded Construction

A lightweight rack has been designed to raise drum spouts to pouring heights or for storage. The new unit is all-steel welded construction and claimed to easily support a fully filled 55 gallon drum. Wide legs are said to assure stability. It is also said to be easily knocked down since only a



STAR

single bolt is involved. The Star Welding Co., 1054 E. 134th St. Cleveland 10, Ohio.

NEW MATERIALS — EQUIPMENT

VINYL COPOLYMER
Compatible With Alkyds

"Exon 470" is claimed to be an extremely versatile polymer having a high order of solubility in ketones, high aromatic tolerance, and compatibility with alkyd type resins. The usual qualities attributed to polyvinyl chloride resins are said to be retained. Company says their product has excellent compatibility in solution and in the dry film with many conventional coating materials. Further claimed is compatibility with alkyd resins supplemented by the unique property of non-reactivity with metallic driers, an important property since driers are essential in a vinyl-alkyd paint system; usually vinyl resins are gelled by metallic driers. Chemical Sales Div., Firestone Plastics Co., Division of the Firestone Tire & Rubber Co., Pottstown, Pa.

EMULSION VEHICLE
For Flats

"Cargill EVT-50" is an emulsion vehicle for inside flat wall paints. It is a combination of synthetic and oleoresinous polymers, claimed to be balanced to exhibit the best properties of each constituent. Manufacturer claims that product is a complete vehicle requiring only pigmentation, viscosity adjustment, and drier addition for paint manufacture. Company says that other features are a uniform, stable paint with great durability on all kinds of interior surfaces, including wood; a complete vehicle which allows paint manufacturers to reduce their inventories of raw materials; possibility of doubling a plant's output without increasing labor or equipment costs, because of the elimination of critical steps in paint making. Cargill, Inc., Oil Div., 200 Grain Exchange, Minneapolis, 15, Minn., and, P.O. Box 1075, Pittsburgh 30, Pa.

RESINOUS POLYALCOHOL
For Formulating Primers, Finishes

New resinous polyalcohol for the manufacture of chemically resistant finishes has been announced. Vehicles may be prepared from esters of this product, known as "Dow Resin 622." These esters are said to have the necessary properties required for the preparation of spar and floor varnishes, floor enamels, maintenance paints, and industrial primers and finishes. Exterior exposure to date is said to indicate excellent durability of coatings prepared from the new resin as clear finishes. Company claims that some of the physical properties of esters prepared from the resin have: Excellent solution and film color; Excellent ester solubility in aliphatic solvents of low Kauri Butanol value; Superior alkali and water resistance; Good durability; Good flexibility, and fast dry. The Dow Chemical Co., Midland Mich.

JAR ROLLING MILL
For Heavy Duty

Company has designed heavy duty jar rolling mill claimed to have a wide range of applications wherever tumbling or grinding on a small scale is required. By lifting the idler out of the notches in which it is set, the correct space for the containers to be processed can be readily secured. The rollers are equipped with sealed ball bearings that are claimed never to need lubrication. The tray under the rolls is removable. The rolling mill will accommodate a number of jars or containers at one time. It is available in two sizes—15" and 24" long. Paul O. Abbe, Inc., 239 Center Ave., Little Falls, N. J.

NEW MATERIALS — EQUIPMENT

VINYL ACETATE LATEX
For Interior Finish

New and tougher, water-resistant paints, based on a vinyl acetate resin latex developed by the company, are claimed to provide increased resistance to aging. Paint formulations based on this vinyl acetate resin latex, designated WC-130, are said to form tough yet stable surface films quickly. The stabilizing system is claimed to impart increased water resistance to these latex films and also to produce marked resistance to foaming during manufacture of paint. A wide range in many hues is available through various pigment combinations. Bakelite Company, a Division of Union Carbide and Carbon Corp., 260 Madison Ave., New York 16, N. Y.

ANTI-SKINNING AGENT
Odorless Type

"Exkin No. 3", anti-skinning agent, is said to have such a mild odor that it cannot be detected in finished paint. Depending on the nature of the vehicle and the drier system, the company says that it will usually be found that from 1 to 4 pounds will protect 100 gallons of paint. Being crystalline in form, it may be incorporated in the paint by sprinkling the weighed amount of crystals into the batch during agitation. It is further claimed to have 100 per cent active ingredients; have a specific gravity of (80°F.): 1.074; and a melting point of 87°-88°C. Nuodex Products Co., Inc., Elizabeth, N. J.

ALKYD RESIN SOLUTION
Thixotropic Vehicle

The company refers to thixotropic as, "a material which shows a reversible gel-sol transformation with the addition of work." At rest it is a gel, but with the addition of work or energy, whether in the form of heat, agitation, by shaking, or even by the application of ultrasonic waves, it reverts to a complete solution. The solution on standing will then reverse itself and again become a gel. The company's new "Burnok" group of paint vehicles are claimed to produce paints which provide the closest approach to complete thixotropy. Available vehicles in the "Burnok" group are, No. 9500-1 Flatwall Alkyd; No. 9501-1 Enamel Alkyd; and No. 9502-1 Gel. Stresen-Reuter, Inc., 2113 Medill Ave., Chicago 47, Ill.

MELAMINE RESIN
Fast Curing

"Uformite MM-47," is a melamine formaldehyde polymer used in baking enamels. Manufacturer claims the following features for the product: fast curing speed; excellent hardness and mar resistance; wide compatibility with short and medium length alkyds; excellent gloss and gloss retention; high resistance to soap and alkali; excellent color and color retention. Company says that baking enamels containing the product can be reduced with xylol, tulol, high boiling aromatic napthas, ketones and esters. Additional butyl alcohol can be used where lower viscosities and higher enamel solids are desired. Mineral tolerance is claimed to be good, which means that some weak solvents can be included in the formulation. Manufacturer says product can be used in either oxidizing or non-oxidizing short oil alkyds as well as longer oil alkyds. Further information available from Rohm & Haas Co., Washington Square, Philadelphia 5, Pa.

all over America it's . . .

PVO for Paint & Varnish Oils

see your local PVO representative for information

62 Townsend Street
San Francisco 7, Calif.

3135 East 26th Street
Los Angeles 23, Calif.

SAFFLOWER
LINSEED
TUNG
SOYA
OITICICA
CASTOR
FISH

1 ATLANTA, GEORGIA
G. R. Nottingham

2 BALTIMORE, MARYLAND
W. R. McClayton & Co.

3 CHICAGO, ILLINOIS
Daniel G. Herely Co.

4 CLEVELAND, OHIO
Donald McKay Smith Co.

5 DALLAS, TEXAS
W. W. Richerson

6 DETROIT, MICHIGAN
George E. Moser & Son, Inc.

7 HOUSTON, TEXAS
Texas Solvents & Chemicals Co.

8 KANSAS CITY, MISSOURI
Ack Sales Company

9 LOS ANGELES, CALIFORNIA
California Flaxseed Products Co.

10 LOUISVILLE, KENTUCKY
B. H. Boyet & Co.

11 MILWAUKEE, WISCONSIN
J. W. Copps

12 MINNEAPOLIS, MINNESOTA
Horton Earl Co.

13 MONTREAL, QUEBEC, CANADA
B. & S. H. Thompson & Co. Ltd.

14 NEW YORK CITY, N. Y.
Garrigues, Stewart & Davies, Inc.

15 PHILADELPHIA, PENNSYLVANIA
Baker Industrial Oils Co.

16 PITTSBURGH, PENNSYLVANIA
H. E. Trench Co.

17 SAN FRANCISCO, CALIFORNIA
Pacific Vegetable Oil Corp.

18 SEATTLE, WASHINGTON
W. Ronald Benson, Inc.

19 ST. LOUIS, MISSOURI
Ivan T. Bauman Co.

20 TORONTO, ONTARIO, CANADA
B. & S. H. Thompson & Co. Ltd.

Personnel Changes

GENERAL PAINT

Winthrop C. Henderson, C. P. A., has been appointed assistant to the president of the company, according to an announcement from the office of R. B. Robinette, president. His fields of operation will extend to matters of budget, tax and accounting. He received his A. B. from Willamette University and an M.B.A. from the Stanford Graduate School of Business. His business associations include work as a public accountant with Arthur Andersen & Co., assistant comptroller of Sudden & Christenson, Inc., and assistant treasurer of the Waterman Co. of California. He is a member of the American Institute of Accountants and the California Society of Public Accountants.

W. C. Henderson

STANDARD-TOCH

James S. Wolf has retired after forty years with the company, according to an announcement from Milford H. Corbin, president. He has served in many executive capacities with the company, most recently as secretary, treasurer and director. He was president of the New York Paint, Varnish & Lacquer Association in 1934-5, at which time he was also vice president of the national association. **William G. Torrace** has been elected to succeed him as Secretary-Treasurer.

PITTSBURGH PLATE GLASS

Wallace E. Shepard, Jr. has been appointed national industrial account executive for the company's paint and brush division, it was announced by E. D. Peck, divisional vice president. He will make his headquarters at the firm's general office, Pittsburgh, Pennsylvania. **Thomas E. Neubauer** will succeed Shepard as industrial paint sales manager at Springdale, where he will make his headquarters.

NATIONAL CAN

C. Carlton Colyer has been appointed sales representative in the Pennsylvania territory, according to an announcement from John S. Morrison, vice president in charge of sales. He will make his headquarters in the company's Philadelphia office.

ATLAS POWDER

Dr. J. Peter Kass has resigned as director of research. He will continue to serve as a special consultant on the company's food research program. He joined the company in 1947 as group leader of organic research and, in 1948, became associate director of research. He was named research director in 1951. **Dr. Robert S. Rose, Jr.,** has been named acting director of the research department. He was associate research director and has been with the company since 1935.

MACBETH

Robert E. Meeker has been promoted to the position of sales manager, according to Warren B. Reese, general sales manager of the company in Newburgh, N. Y.

COMMERCIAL SOLVENTS

Sydney T. Ellis has been named an executive vice president of the corporation, according to an announcement made by J. Albert Woods, president. He has been associated with the organization since 1951 and has been a member of the board of directors since 1953. His previous position was administrative vice president. He is a graduate of Virginia Polytechnic Institute and a member of the Commercial Chemical Development Association, Society of Chemical Industry. and the American Chemical Society.

S. T. Ellis

UNION CARBIDE & CARBON

John A. Field has been appointed vice-president of the company, a Division of Union Carbide and Carbon Corporation, according to an announcement by H. B. McClure, president of Carbide and Carbon Chemicals. In his new capacity, he will be responsible for sales development and related activities, including the company's fellowships at Mellon Institute, in Pittsburgh. He has just returned after a six-month leave of absence during which time he acted as Assistant Administrator of the Business and Defense Services Administration, United States Department of Commerce. He joined the company in 1936 as a unit foreman in the production of miscellaneous new chemicals. From 1939 to 1940, he engaged in research at Mellon Institute and came to New York in 1941. During World War II, he was a department head in the production of butadiene from alcohol at the Institute, West Virginia plant. He later became manager of the production control section, Office of Rubber Reserve of the Reconstruction Finance Corp. After the war he rejoined the company as product manager in the Fine Chemicals Department, a position he held until he became assistant manager of the Fine Chemicals Department in 1952. He held this last position until he went to Washington in June, 1954.

KOPPERS

Dr. A. R. Powell, who has been associate manager of the central Research Department since 1949, has been named acting manager of that department following the resignation of Dr. G. F. D'Alelio, according to an announcement from W. F. Munnikhuysen, executive vice president. Dr. D'Alelio has consented to remain with the company for the time being to carry out a special project on high-impact plastics. Dr. Powell will coordinate research activities of the company's six operating divisions and assume responsibility for operations at the company's laboratories at Verona, Pa., and for coordination of company-sponsored fellowships in various national research institutions and universities. He was a member of a technical intelligence mission sent to Germany under Army auspices in 1945, and is a member of the American Chemical Society, serving as chairman of the Society's Gas and Fuel Division in 1937 and as chairman of the Coal Technology Division of the Pittsburgh Section in 1946. He also is a member of the American Institute of Mining Engineers, the Society of Chemical Industry, the Western Pennsylvania Society of Engineers, the American Gas Association, and the Eastern States Blast Furnace and Coke Oven Association.

BARRETT DIVISION

C. G. Stupp has been appointed to the position of vice president, according to announcement from T. J. Kinsella, president of Barrett Division, Allied Chemical & Dye Corp. He has been technical director since 1951. First employed by the company thirty-eight years ago as a research chemist he has held positions of increasing responsibility in manufacturing and research since then. He will continue to head technical activities, including the extensive research and development department in Edgewater, N. J., Glenolden, Pa., and Toledo, Ohio.

C. G. Stupp

ASTM

Frank Y. Speight has joined the staff of the American Society for Testing Materials as assistant technical secretary. He will be located at ASTM headquarters in Philadelphia. For the past eight years, he has been on the staff of the National Academy of Sciences, National Research Council, Advisory Board on Quartermaster Research and Development as assistant to the executive director. Previously he was engaged in plastics development with the American Cyanamid Co. His duties will be technical and editorial in nature.

GOODYEAR

Donald S. Black has been appointed to the sales service section of the Chemical Division, according to an announcement from A. E. Polson, manager of sales service. He will handle expanding technical sales service on rubber reinforcing resins and the Chemigum rubbers. Since 1951 he has worked on the company's production and staff squadrons in compound and process development work for the Industrial Products Division. His work consisted primarily of devising operating specifications for mills, banburies, and calendars.

D. S. Black

DOW

William B. Guerrant and **Roy C. Simon** have been appointed field representatives in charge of technical assistance in the industrial uses of plastic coatings. Guerrant will handle coatings

W. B. Guerrant

R. C. Simon

technical service activities in Georgia, Florida, North Carolina, South Carolina and Alabama, with headquarters in the Atlanta, Ga., office. He came to the company in 1950 after serving in the research and development laboratories in the Dan River Mills, Inc., Danville. Simon has been assigned like duties on the West Coast and will make his headquarters at the company's Los Angeles office. Prior to joining the company in 1952 he taught science in North Dakota and Minnesota schools.

CLOPAY

D. Saunders Threlkeld has been appointed manager of the company's research and control laboratories. He has had considerable experience in the field of vinyl plastics and organic coatings and finishes. Prior to his association with the company, several years ago, he was with the chemical research laboratories of the National Cash Register Co.; Wright Field Material Command at Dayton, Ohio and a materials engineer with the Kentucky Department of Highways. He succeeds Philip H. Rhodes who recently left the company to enter the consulting field.

BATTELLE

Dr. Ray E. Heiks has been placed in charge of sponsor relations in the Institute's Department of Chemistry, Dr. Clyde Williams, president and director of the Institute, has announced. In his new position, he will provide liason between the research center and the chemical and allied industries. Previously, he was in charge of the research group specializing in problems of physical chemistry. He joined the Institute in 1942.

W. C. Finley has joined the staff of the Institute, and will spearhead a program to expand research facilities for the forest-products and wood-using industries. He will provide liaison between the research center and the wood industries and will interpret the research needs of these industries, according to Dr. Williams.

PALMER-SHILE

Raymond Shile has been appointed manager of the new eastern sales office which will be located in New York City. The appointment was announced by Edward E. Shile, vice president and sales manager. The new manager is a graduate of the U.S. Naval Academy. After active service in World War II, he joined the company as a sales engineer, and has served in that capacity ever since with the exception of three years with NATO in Europe during the Korean War.

Raymond Shile

CARBIDE & CARBON

Dr. R. L. Bateman has been appointed to the newly created position of director of development. He was formerly manager, Fine Chemicals Div. In this new capacity he will work with **John A. Field** who was recently made vice president in charge of sales development and related activities. **W. A. Woodcock** has been appointed manager, Fine Chemicals Div. and **Dr. R. H. Wellman** has been appointed manager, Agricultural Chemicals Div. Both will assist Dr. Bateman in developing markets for the company's newer products. The changes in Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp. were announced by H. B. McClure, president.

V. J. DOLAN

Fred C. Harrington, Jr. has been appointed to the technical sales division, it was announced by M. J. Fernan, sales manager. He will represent the company in the St. Louis area. He has been associated with the wood and metal industries for the past twenty-four years.

NPVLA

Louis Fisher has been named director of trade sales for the National Paint, Varnish and Lacquer Association. He succeeds Laurence Kiefer. **Walter R. King** succeeds Fisher as industry relations director. **William T. Terrell** has been assigned to the industrial product finishes division.

NATIONAL STARCH

E. W. Bousquet, the company's Plainfield, N.J., supervisor of polyvinyl emulsion operations, has been selected as plant superintendent for the new Meredosia, Ill., plant, according to an announcement from A. A. Halden, executive vice president. Joining the company after his graduation from Rensselaer Polytechnic Institute with a B.S. in chemical engineering, he has been directly responsible for the installation and operation of improved production facilities, as well as the successful manufacture of many new types of resin products.

E. W. Bousquet

AMERICAN CYANAMID

Wayne T. Kent has been appointed employee relations supervisor of the company's new titanium dioxide plant in Savannah, Ga., it was announced by J. Allegaert, general manager of the Pigments Division. He joined the company in 1948, and was engaged in personnel work in the plant in Wallingford, Conn., and research laboratories in Stamford, Conn. In 1953 he transferred to Davis & Geck, Inc., a company subsidiary, where he became personnel manager. A native of Connecticut, he was graduated from the University of North Carolina in 1948.

W. T. Kent

NATIONAL LEAD

David J. Blythe has been appointed production superintendent, metals manufacturing. He has been general superintendent of the Atomic Energy Commission's Feed Materials Production Center in Fernald, Ohio, since 1951. This plant is operated under contract by National Lead. Beginning his company career at the Matawan, New Jersey, plant in 1926, he was transferred in 1932 to the Perth Amboy plant as assistant superintendent of the smelting and refining department. Later that year he was placed in charge of the department. He was appointed superintendent of the metals department in Perth Amboy in 1939 and general superintendent of the plant in 1945. He was transferred to the Atomic Energy Commission operation in May 1951.

GENERAL PAINT

W. L. Watkins, formerly assistant to the president, has been appointed general manager of the Domestic Division of the corporation, according to an announcement made by R. B. Robinette, president. The appointment culminates a program of dividing the company into three separate operating divisions. The two other operating divisions are the Export Division, headed by Marc A. Dupont; and the Hill, Hubbell Division headed by Milton M. Bowen.

W. L. Watkins

GLIDDEN

W. J. Barnett, Russell Hyde, and **Russell Hale** have received important sales posts with the company's Chemicals-Pigments-Metals Division, according to Ralph B. Quelos, general sales manager. Barnett, former sales manager of the division's West Coast operations, has been transferred to Atlanta, Ga. He will service and develop the southeastern and south central sections of the country. Hyde will replace the late E. G. Schuermann as sales representative in the St. Louis territory. Hale has joined the firm to augment the sales efforts of W. P. Weber in metropolitan New York and northern New York and New Jersey.

HERCULES

John J. B. Fulenwider, general manager of the Cellulose Products Dept. and a member of the board of directors since 1945, was elected a vice president, and member of the executive committee. Named to succeed him as general manager at the Cellulose Products Dept. is **Elmer F. Hinner,** a member of the board since 1952 and general manager of the company's Virginia Cellulose Dept. since 1950. **Edward G. Crum,** assistant general manager of the Cellulose Products Dept., was named general manager of Virginia Cellulose to succeed Mr. Hinner. The elections were announced following a regular meeting of the company's board of directors.

PFIZER

Carl W. Lorentzen, formerly with the Valspar Corp., will represent the company's Chemical Sales Division in the southern portion of Manhattan. **Daniel V. Reidy** will cover parts of Brooklyn and Long Island, and **Robert E. Derges** will represent the Division in Chicago and its southern and western suburbs. The announcement was made by Frank L. Black, Division sales manager.

U. S. GYPSUM

R. H. Mazy, formerly assistant sales manager, Paint Products, in United States Gypsum Company's Chicago office, has been named district manager of the Southwest Paint District, with headquarters in Dallas, it has been announced by R. H. Chandler, dealer sales manager of the Great Plains Region. He joined the company as a correspondent-trainee in 1948, and was appointed line salesman in the San Francisco office later that year, becoming assistant sales manager, Paint Products, in 1952.

NATIONAL LEAD

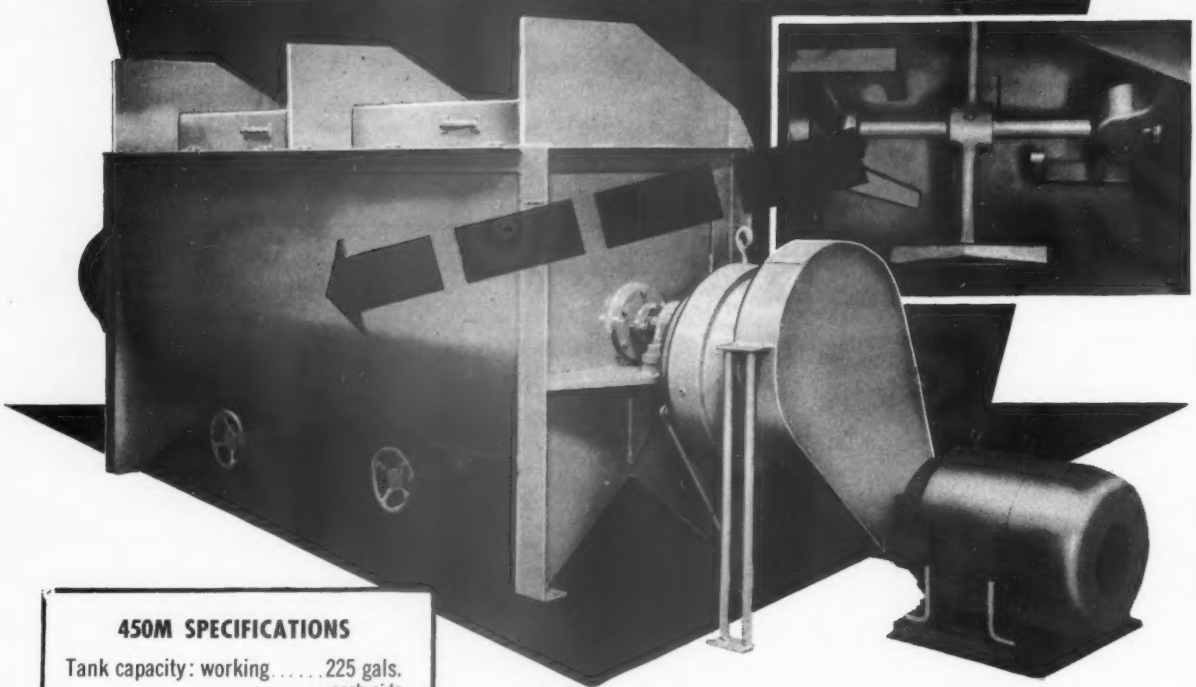
John K. Campbell has been appointed manager of the Pigment Div. of the company's Southwestern Branch, with headquarters in Dallas, Texas. He succeeds **Walter H. Lessmann,** who retires from service on **January 1, 1955.**

Mr. Campbell joined National Lead in 1931 as a clerk to the superintendent of the Cincinnati Branch. He became technical representative on pigments and oxides for the branch in 1946 and sales manager, pigments, oxides and chemicals in 1948. In 1951 he moved to the Southwestern Branch as assistant manager, pigments, oxides and chemicals.

Mr. Lessmann started his career with the company in St. Louis in 1919. He became sales manager of the white lead department there in 1936, moving to the Cincinnati Branch as assistant manager in 1940. In 1948 he was appointed assistant manager of the St. Louis Branch and was transferred to the Southwestern Branch two years later as branch manager.

Announcing

THE NEW LEHMANN HEAVY DUTY TWIN PASTE MIXER



450M SPECIFICATIONS

Tank capacity: working.....225 gals. each side
full.....240.5 gals. each side
Total working capacity.....450 gals.
Tank size: diameter.....36 in.
length.....48 in.
Bearings: self-aligning Roller Bearing pillow blocks externally mounted
Shaft Speed: 40 RPM
Shaft Size: 2 1/16 in. dia., 5/8" x 5/16" keyway.
Drive: Roller chain, or Gearmotor with V-belt reduction.
Power required: 15 to 25 hp, depending on application.
Weight, including skids, pulleys and drives, but without motors, guards: 7000 lbs.

The new Model 450M Heavy Duty Twin Paste Mixer is designed to work in conjunction with high production mills. The two compartments mix and discharge alternately from the bottom to provide an unbroken flow of thoroughly mixed material.

This is a rapid cycle mixer. Its new paddle action was designed for optimum mixing efficiency. The unique shape and positioning of the blades produce thorough mixing action throughout the entire pigment and vehicle mass—at the ends, sides and center of the tank simultaneously. The last portion of a batch is forced by positive blade action through the center discharge opening.

Need for such a highly efficient continuous-feed paste mixer was realized upon introduction of the Lehmann Model 631-V Sight-O-Matic* Three Roll Paint Mill. While they are an unbeatable combination together, the Model 450M Paste Mixer, even when used with other mills, can be counted on to boost production.

Send for complete information and prices.

*Reg. U. S. Pat. Off.

LEHMANN®

J. M. LEHMANN COMPANY, Inc.

MAIN OFFICE AND FACTORY: 558 NEW YORK AVE., LYNDHURST, N. J.

PATENTS

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PATENTS AND COPYRIGHTS

424 Bowen Building,
Washington, D. C.

Complete copies of any pattents or trade-mark registration reported below may be obtained by sending 50c for each copy desired (to foreign countries $1.00 per copy) to Lancaster, Allwine & Rommel.

Silver Paint

U. S. Patent 2,695,275 . . Robert B. Gray, Erie, Pa., assignor to the Erie Resistor Corporation, Erie, Pa., a corporation of Pennsylvania.

A water base paint for producing a film having good electrical conductivity before drying and reducible by firing after drying to a metallic silver film comprising a finely divided metallic silver pigment, a vehicle of polyvinyl alcohol, water, and an antifoaming agent.

Aqueous Resin-Wax Floor Coating Dispersions

U. S. Patent 2,695,277 . . Aruthur C Pabst, Douglaston, Rudolph J. Holzinger, North Merrick, and Elizabeth J. Gavin, Port Washington, N. Y., assignors to Socony-Vacuum Oil Company, Incorporated, a corporation of New York.

A low-viscosity aqueous dispersion consisting essentially of a hard natural wax selected from the class consisting of carnauba wax, ouricury wax and candelilla wax, and a wax-immiscible resin produced by emulsion polymerization selected from the class consisting of polymethacrylic acid, polystyrene and eopolymer of vinyl acetate and methacrylic acid, substantially all the wax particles and substantially all the wax-immiscible resin particles present in the aqueous dispersion being of the same average diameter and less than 1 micron.

Polymerization of Vinyl Acetate in Emulsion

U. S. Patent 2,694,052 . . Peter J. Canterino, Yonkers, N. Y., assignor to Nopco Chemical Company, Harrison, N. J., a corporation of New Jersey.

A process for preparing a stable aqueous emulsion of polyvinyl acetate comprising polymerizing vinyl acetate in an aqueous emulsion in the presence of from about 0.1% to about 2.0% of a fatty acid ester having a carbon chain length of from 9 to 24 carbon atoms and containing an SO_3 group, the fatty acid portion of said ester having a carbon chain length of 8 to 18 carbon atoms, a catalyst selected from the class consisting of peroxy and persulfate catalyst, from about 0.001% to about 0.9% of an aliphatic mercaptan, from about 0.001% to about 0.005% of a complex inorganic cyanide compound selected from the class consisting of sodium ferricyanide, potassium ferricyanide, sodium ferrocyanide and potassium ferrocyanide and from about 1.0% to about 10.0% polyvinyl alcohol.

Tall Oil Esters

U. S. Patent 2,695,897 . . Maxwell A. Pollack, Morris Plains, N. J.

A resin composition comprising a vinyl chloride resin and a fraction of the esters of tall oil with a monohydric phenol, the said fraction being substantially free of material distilling up to 220° C. at 2 mm. of mercury pressure, containing all of the tall oil and monohydric phenol esters boiling above 220° C. at 2 mm., and serving as plasticizer for the vinyl chloride resin and giving a composition characterized by freedom from exudation of plasticizer on standing.

Polysiloxane Resin Compositions

U. S. Patent 2,695,276 . . David B. Hatcher, Toledo, Ohio, assignor, by mesne assignments, to Allied Chemical & Dye Corporation, New York, N. Y., a corporation of New York.

A synthetic resin that is an ester (1) a substance whose molecule contains at least one silicon atom to which at least one hydroxy group is attached, and to

which at least one hydrocarbon group is attached by a carbon-silicon linkage, with (2) a fatty acid-modified condensation polymer of the class consisting of reaction products of (*a*) an epihalohydrin in which the halogen atom has an atomic weight between 35 and 80 with (*b*) a dihydric phenol, and reaction products (*a*) such an epihalohydrin with (*b*) a sulfonamide whose molecule has at least two hydrogen atoms each connected to a sulfonamide nitrogen atom, the amount of substance (1), on a fully condensed basis, being from 25 to 75 per cent of the total weight of the synthetic resin.

Nonflaking Heat Resistant Aluminum Paint

U. S. Patent 2,694,691 . . Morris Braunstein, Cleveland, Ohio, assignor to The Sheffield Bronze Paint Corporation, Cleveland, Ohio.

An article of manufacture comprising sheet iron which has been coated with a composition consisting essentially of 8 to 14 parts of calcium naphthanate, 112 parts coumarone-indene resin, 10 to 50 parts paraffin oil, 250 to 350 parts of an aromatic hydrocarbon solvent, all of said portions being by weight, and sufficient aluminum powder to yield a paint having two pounds of metallic aluminum per gallon.

AZO Pigment

U. S. Patent 2,694,056 . . Thomas E, Ludwig and Oswald E. Knapp, Chicago. Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio, a corporation of Ohio.

A red pigmentary substance of improved light and heat stability consisting essentially of the calcium salt of the azo dyestuff formed upon diazotization of dichloroaniline monosulfonic acid selected from the group consisting of 2,3-dichloroaniline-5-sulfonic acid and 3,4-dichloroaniline-6-sulfonic acid, and coupling the said acid with 2-naphthol.

Epoxide Resins

U. S. Patent 2,694,694 . . Sylvan Owen Greenlee, Racine, Wis., assignor to Devoe & Raynolds Company, Inc., Louisville, Ky., a corporation of New York.

The single stage process of producing high melting point epoxide resins having a melting point above 115° C. which comprises reacting with heating under pressure in a closed vessel, a chlorhydrin selected from the class which consists of epichlorhydrin and glycerol dichlorhydrin with a dihydric phenol free from reactive groups other than phenolic hydroxyl groups in the presence of sufficient aqueous caustic alkali to combine with the chlorine of the chlorhydrin, the proportions of chlorhydrin to the dihydric phenol being more than 1:1 and less than 1.2:1, the reaction being carried to a temperature above 110° C. while maintaining pressure in the closed vessel, separating the by-product salt and any aqueous alkali from the resulting epoxide resin, adding preheated hot water to the resin under pressure in the closed vessel and agitating and washing the resin under pressure with hot water until the wash water is free from salt and caustic alkali, releasing the pressure, and continuing the heating of the resin to free it from residual water.

NEWS

Dr. J. C. Warner President-Elect Of American Chemical Society

Dr. John Christian Warner, president of the Carnegie Institute of Technology, and a key figure in the World War II atomic energy program, has been chosen president-elect of the American Chemical Society. He will head the Society in 1956.

President for 1955 will be Prof. Joel H. Hildebrand of the University of California, who takes office Jan. 1, succeeding Professor Harry L. Fisher of the University of Southern California.

At the same time two members of the Society's board of directors were re-elected to three-year terms as regional directors. They are Dr. Wallace R. Brode, associate director of the National Bureau of Standards, Washington, D. C., and Prof. William G. Young, dean of the division of physical sciences in the University of California at Los Angeles.

Dr. Clifford F. Rassweiler, vice-president for research and development of the Johns-Manville Corp., New York, was named a director-at-large for a four-year term. He succeeds Walter A. Schmidt of Los Angeles.

•

Synthetic Rubber Grade Styrene Monomer Available to Industry

Koppers Company, Inc. has announced that its synthetic rubber grade styrene monomer, previously available only to government synthetic rubber plants, will be made available immediately to industrial users.

The company said it believes that availability of this grade of styrene monomer will enable certain American industries to improve the economics of their operations recently hurt by foreign competition. These industries previously had available only a commercial grade of styrene monomer at a higher price. The monomer now being made available is entirely suitable for use in tires, rubber soles and heels, styrene-butadiene latices, for paper, textiles, floor tile and paint industries, and in the polyester and alkyd fields.

The monomer will have a minimum styrene content of 99 per cent and not more than 0.020 per cent sulfur content. Monomer of this purity is believed to be entirely satisfactory in all applications except in the production of the plastic, polystyrene.

Reichhold Chemicals to Occupy Entire General Office Building

Reichhold Chemicals, Inc., is now set to occupy the entire two-and-a-half story building at 525 North Broadway, White Plains, N. Y., as its executive offices, Henry H. Reichhold, board chairman, has announced. For more than six months the firm has used the second floor of the modern air conditioned structure which was completed in the spring of 1952.

All administrative, sales, foreign and export departments will be under one roof and visits from plant managers from all parts of the world are expected to become more frequent. To hasten their arrival in White Plains from the two principal New York airports, a helicopter shuttle service will be retained, reducing the trip from Queens to the Westchester County offices to a matter of minutes.

Reichhold's acquisition of the building as a whole—65,000 square feet of space—was made possible by the transfer of the executive offices of Alexander Smith, Inc., carpet manufacturer, to its sales office in New York City and to its plant in Greenville, Miss.

•

Freeman Chemical Corp. Appoints Frank Seitz Sales Co. to Staff

The Freeman Chemical Corp. of Saukville, Wis., has announced the appointment of The Frank Seitz Sales Co. of Des Moines, Iowa, as sales representatives for Iowa and Nebraska.

NEWS

Salesmen At Sherwin-Williams Co. Win Expense-Free Trip to Mexico

The Sherwin-Williams Co. will send nine award-winning salesmen and their wives on an all-expenses-paid week-long tour of Mexico this month.

Each winner took first place in his respective classification in the company's National Top Achievement Contest for the 1954 fiscal year. Competing were sales personnel from coast to coast, according to Arthur H. Burt, vice president and director of sales. The sales champions were:

George D. Wartman, area sales manager, Hollywood, Calif.; Walter F. Fasting, area sales manager, San Antonio, Texas; Al Hohman, area sales manager, Jackson, Miss.; William E. Masters, branch manager, McKeesport, Penna.; Francis K. Buckley, dealer representative, Newark, N. J.; Theodore W. Hinkley, painter-maintenance representative, Washington, D. C.; Fred C. Horn, industrial sales representative, Bucyrus, Ohio; Robert J. Collins, transportation zone representative, Westchester, Ill.; and R. Boyd Fulgham, automotive zone representative, Portland, Ore.

In addition to the tour, each winner receives a jeweled platinum lapel emblem, with the famous "Cover the Earth" trademark, and a cash award.

Mr. Burt reported the third annual Top Achievement Contest established new sales records in many categories. The basis for determining the winners is sales to new customers, together with total sales gains. Scoring is recorded under a point system which gives a representative operating under conditions of limited opportunity an equal chance to compete with his sales colleagues in other areas. The 12-month contest opened September 1, 1953.

A total of 87 representatives and branch managers won lapel emblems, plus cash awards, for winning first, second or third places.

•

John McE. Sanderson Retires After 44 years in Paint Industry

John McE. Sanderson has retired after forty-four years with the protective coatings industry. He was assistant to the general manager of the plastics and resins division of the American Cyanamid Co.

•

Du Pont Opens Newark Laboratory For Research on Pigment Colors

A new laboratory for research on colors was opened on Dec. 10 by the Du Pont Co. at its Newark pigments plant. The keys to the building were officially presented to Dr. J. Nelson Tully, laboratory director, by Frederick H. Weismuller, general manager of the pigments department.

Research, which was formerly conducted at various locations in the plant, can now be consolidated.

CORRECTION

On page 67 of Paint and Varnish Production, November, 1954, the formulation of baking organosol metal coating is listed under Table V. The Bakelite Company feels that while that formula would undoubtedly give good results, superior exposure results can be obtained with the corrected formulation printed below.

XDE-5197
Red Organosol Metal Coating

Formula	Pounds	Gallons
"Bakelite" vinyl resin VYNV-1	21.6	1.86
"Flexol" plasticizer DOP	7.9	0.97
Diisobutyl ketone	7.5	1.12
High boiling diluent (1) (aromatic type)	25.5	3.54
Pigment (2)	2.7	0.17
Lecithin (3)	.05	—
"Bakelite" vinyl resin VAGH	5.20	0.45
Methyl "Cellosolve"	7.25	0.90
Toluene	22.1	3.10
"Bakelite" resin BR-18774	.2	0.02
	100.00	12.13

(1) Such as "Solvesso" #100, Esso Standard Oil Co., New York, New York
(2) Such as "BON" RT-565-D, E. I. du Pont de Nemours & Co., Wilmington, Del.
(3) Such as "Lecithin NS," Clidden Co. Soya Products Div., Chicago 39, Ill.

NEWS

Fatty Acids, Glycerine Talks Slated for 28th Soap Industry Convention

A full program on fatty acids and a number of papers on glycerine, will be important features of the 28th Annual Soap Industries Convention. The event is sponsored by the Association of American Soap & Glycerine Producers, Inc., and will run from Jan. 26 through 28 at the Waldorf-Astoria Hotel, New York City.

A discussion of world trends in fats and oils for 1955 and descriptions of new usage of chemicals from fats will take up most of the first day. On the following day, the Third Annual Glycerine Research Awards, with $1,000 as a grant to the winner, will be made. Other Glycerine Division features will include talks on new edible packaging materials based on glycerine, and recent progress in freezing and reviving living matter from glycerine solutions.

Concurrently, the Association's Specialty Soap Div. will include talks on the introduction, advertising and publicizing of new specialty soap and detergent materials.

The complete program of the fatty acids and glycerine divisions follow:

Wednesday, Jan. 26

FATTY ACID DIVISION

10 A.M. to Noon. Business Meeting, Committee Reports, Election of Officers. Opening Remarks by Sewall D. Andrews, Jr., Division Chairman. Winfield I. McNeill, Management Consultant, *Cost Allocation and Control.*

12:30 P.M. Division Luncheon, Sewall D. Andrews, Jr., General Mills, Inc., Presiding. Introduction of New Steering Committee. Tom E. Doak, Longstreet-Abbott & Co., *World Trends in Fats and Oils 1955.*

2:30 to 4:30 P.M. Panel. *Fatty Acid Application Trends.* F. C. Haas, Archer-Daniels-Midland Co., Moderator. Malcolm F. Graham, Standards Div., Research & Development Dept., Colgate Palmolive Co., *Toiletries.* Melville Ehrlich, Research Director, American Lubricants, Inc., *Lubricating Grease.* J. M. Wilkenson, Central Research Laboratory, General Aniline & Film Corp., *Vinyl Stearate and Related Polymers.*

5 P.M. Cocktail Party. Host—*Soap & Chemical Specialties Magazine.*

Thursday, Jan. 27

GLYCERINE DIVISION

2:15 P.M. F. E. Lacey, Swift & Co., Presiding. C. S. Miner, Jr., Miner Laboratories, *Glycerine Resin Research.* H. H. Besuden, Procter & Gamble Co., *Glycerine Promotional Plans.* J. J. Craig, G. M. Basford Co., *A Review of Cell Preservation by Freezing in Glycerine.* R. O. Feuge, Agricultural Research Service, U.S.D.A., *Acetoglycerides and their Application.* E. S. Pattison, Manager Glycerine Division, *Changing Times for Glycerine.* Business Meeting, Election of Officers.

•

Reardon Production Managers Hold Two-Day Session in St. Louis

A conference of Reardon Co. production managers met in St. Louis, Dec. 13-14, to discuss techniques in production, purchasing and quality control. The conference was under the supervision of Sidney J. Burgeson, Reardon's general production manager.

The production phase of the conference included a full exchange of ideas and the presentation by Burgeson of a program to improve production methods and facilities.

Reardon's general purchasing agent, William M. Fitzgerald, led a discussion of purchasing policies, and Ben Zmuda, director of research for the company, presented a program for improving controls procedures on raw materials and finished products.

A feature of the meeting was a tour of the company's new St. Louis plant.

Also taking part in the conference were production manager Paul E. Cote and purchasing agent Russell Clendenning of the company's Montreal plant; production manager Joseph J. Trocki and his assistants, Andrew Liga and Alfons Drzewinski of the Bayonne, N. J., plant; Rene J. Bourg, production manager of the Los Angeles plant, and St. Louis production manager Michael J. Reardon and his assistant, Cecil Sumpter, Jr.

PRODUCTION CLUB

(*From page 37*)

Federation had scheduled a Spring Meeting for Cincinnati on Friday, April 29th and they had requested that we have either our April or May meeting on that date.

The annual election comes in May. Past experience has shown that it is difficult to conduct an election at a joint Club and Federation meeting. The group, as a whole, felt this situation could be obviated, by having the nominations for office in March and the election in April. A motion to this effect was made, seconded, and passed. It was further moved, seconded and passed that May meeting originally scheduled for May 9, be moved up to Friday, April 29 to coincide with the Federation's Spring Meeting. The "Forum-Discussion" is also scheduled for May meeting.

Acting President Bill Foy, in the capacity of program chairman, then introduced the speaker of the evening Frank Rideout, new products engineering department, Bakelite Co., who gave an interesting talk on "Latest Developments in Vinyl Resins for Industrial Applications."

NORTHWESTERN

The December meeting was called to order by President Elmer Stark with 61 members and guests present. The minutes of the November meeting were read and approved.

The president announced that the Ernest Trigg Award for the best secretary reports of the past year was won by Mert Hilke, chairman of the program committee.

Hilke announced that the January meeting would have George W. Gregg of the Advance Solvents Corp. speaking on "The Role of Zirconium & Rare Earth Metals For the Protective Coating Industry."

John Rouse chairman of membership committee gave the final reading on the following names for membership: Hans Dirks, Minnesota Paints, and Alward Johnson, Frost Paints for Class A membership; William Scown, John Thompson and John Hakanson, all of Minnesota Mining & Mfg., for Class B membership.

All were voted into club membership.

Ed Carlson, council representative, reported on the last council meeting at the Convention in Chicago. He stated that there was no vote taken on the amendments proposed last July but that these would be voted on at the next convention in October. He said that a resolution was made to increase the term of council representative from 2 to 3 years. Also that the minutes of the meetings of the Federation Board of Directors which meets 4 times a year be presented to the council representatives who meet twice a year. The date and place of the next Federation convention is Oct. 2 to 6 at the Statler Hotel in New York City.

Jake Skala was appointed to replace Elmer Stark on the corrosion committee of the Federation. President Stark announced that the project "Minimum Paint Film Thickness for Economical Protection of Hot Rolled Steel against Corrosion" has been placed with Dr. Bosch of the North Dakota State College.

A. T. Murfin gave a brief mathematical discussion of the club's paper recently presented at the convention in Chicago.

The meeting was then turned over to M. C. Hilke, program chairman, who introduced the speaker of the evening, Mr. F. Beuge of the Dow Chemical Co. Mr. Beuge's subject was "The Use Of Vinyltoluene in Oils." He discussed the effects of treating A Z2 bodied linseed with vinyltoluene with different ratios of oil to vinyltoluene, in varying amounts of solvents, at different temperatures and with different kinds and amounts of catalysts. Higher temperature cooks give lower viscosity than lower temperature cooks. He discussed the properties of these vehicles in comparison to a medium oil alkyd and styrenated alkyds. He also discussed their use in the three types of paints: fast dry industrial finishes, flat wall paints, and architectural enamels. After a question and answer session the meeting adjourned.

LOS ANGELES

The meeting was held at Scully's Restaurant and was attended by 144 members and guests. President Vern Barrett called upon Les Houy for a report from the good fellowship committee. Houy read a letter from Clarence Gulick expressing his appreciation for the flowers sent to him during his recent illness. The minutes of the preceding meeting were read by the secretary and were approved as read.

The recent meeting attended by the joint executive committees of the Los Angeles and the Golden Gate Production Clubs was described by President Barrett. He stated that important objects of this were, first, an attempt to find a way to pay the travel expenses of council representatives by the Federation and, second, the coordination of meeting dates of the Los Angeles and Golden Gate Production Clubs.

Robert Vignolo, chairman of the membership committee, read the names of all applicants for membership. The following members were proposed and voted in for Class A membership: Stanley M. Brysha, Sherwin-Williams Co.; Robert E. De Muth, Southwestern Paint & Varnish Co.; Larry R. Dunsmoor, Coatings Research Laboratory; J. L. Elder, Olympic Paint & Varnish Co.; Frederick Ganz, Pioneer-Flintkote Co.; John C. McKellar, Sherwin-Williams Co.; Robert A. McNeill, Sherwin-Williams Co.; Warren D. Randall, Jr., H. R. Hunt Putty Mfg. Co., Inc.; Lyle Van Patten, Lyle Van Patten Co.

The following applicants were proposed and approved for Class K membership: Gordon D. Guest, L. H. Butcher Co.; James W. Kay, Kentucky Color & Chemical Co.; Robert G. Trudeau, Trojan Powder Co.

Bob Hollinger of the education committee reported the success of the Hercules Paint School and expressed the appreciation of the club for the event.

Dan Heisler, chairman of the program committee introduced the speaker for the evening, Elias Singer, technical director of Troy Chemical Company. The subject of Mr. Singer's paper was "Additives—A Tool in the Formulation of Organic Finishes." He described the important aspects of commercial additives in paint manufacturing and stated that additives, as such, were not universal in their application. Numerous slides were presented which illustrated different formulations with subsequent substitution of additives and the variations of other proportions in order to retain and to increase good properties and to decrease the cost of formulations. In order to achieve improved mildew resistance the following generalizations were made: Natural ground limestone is better than talc or magnesium silicate; harder and tighter film will have less mildew tendency; drying oils, such as linseed, are better than soya and safflower; zinc oxide in the amount of three pounds is essential; the greater the chalking rate the less tendency to mildew growth; the selection of the proper mildewcide, such as the phenol mercurials, is very important.

Mr. Singer then gave a very interesting analogy between the use of water as a diluent in oleoresinous base paint and the use of hydrocarbons in nitrocellulose lacquer. He stated that very excellent paints with good stability can be made with high amounts of water as a diluent. He concluded by stating that the use of additives widens the scope of raw materials which can be used in the manufacture of organic finishes.

BALTIMORE

The Meeting was held on Dec. 10th, in the Coach Room, Park Plaza Hotel, Baltimore.

A paper was presented by F. J. Smith, Titanium Pigment Corp., entitled "The Development of House Paints Pigmented with Titanium Dioxide." The subject covered a discussion of the various changes that have taken place in house paints over the past 25 years, beginning with white lead and oil and leading up to the most modern ideas dealing with house paints pigmented solely with titanium dioxide.

There will be an election to fill the office of President, the vacancy being created by the resignation of Bill Wright.

LATEX VEHICLES

(*From page 27*)

Crotonic acid copolymerizes well with several monomers, including vinyl acetate. Small concentrations, 5 per cent or less, give markedly improved adhesion, particularly to smooth surfaces such as metal. Such copolymers are alkali soluble.

New Vinyl Esters

The new vinyl esters are indeed new to this country, although extensive work was carried out with them as comonomers with vinyl acetate in Germany. Straight polymers of vinyl propionate, vinyl butyrate and vinyl-2-ethylhexoate are increasingly softer—in that order—than polyvinyl acetate, and have very much greater water resistance than polyvinyl acetate. They exhibit much greater flexibility and adhesion. They definitely impart these properties to copolymers with vinyl acetate—vinyl propionate at concentrations of 35 to 50 per cent; vinyl butyrate in concentrations of 20 to 25 per cent; and vinyl-2-ethylhexoate in concentrations of 15 to 20 per cent. These ranges are approximate. In Germany during the war box cars were painted with vinyl acetate modified by copolymerization with higher vinyl esters; these are still in service and in excellent condition.

Vinyl Crotonate

Vinyl cortonate is a particularly interesting new vinyl ester in its own right, in that it possesses two double bonds capable of polymerization. Used in very low concentrations it is a good cross-linking agent for vinyl acetate, providing a means of increasing the polymer chain length very markedly. Greater chain length gives tougher films of greater water and chemical resistance. Concentrations of the order of 1 per cent are indicated. It should be considered perhaps as a third component in the role of a cross-linking agent.

We have indicated some of the monomers of initial interest to your industry as raw materials for latex paints. These certainly do not include all those which will be utilized in the years to come. Many others shown in the Carbide listing and produced by other manufacturers will be brought into consideration.

It is worthwhile to note that the 48 monomers given in our listing are those which have already reached manufacture at semi-commercial or commercial scale.

Behind these are many more unsaturated compounds in the research stages in our laboratories. Some of these research monomers may be expected to be of interest to the latex paint field. The new research monomers will include such interesting features as new and different configurations and multiplicity of functional groups.

It may be well to comment on the means by which the proper combinations of monomers will be developed to give desired polymers for the paint field. Certainly the extensive research work both on the process of producing the right polymers and on evaluation of these polymers in paint films requires substantial investment in time, personnel and money. It is obvious that the creation of new polymers for the paint field cannot be undertaken by all participating in the paint industry.

Certainly some of the polymers of basic interest are and will be manufactured by concerns who have been in the polymerization business for many years, such as our own Bakelite Company, DuPont, American Polymer Corporation, and several other. It is of keen interest to us, however, that much research is now going on in the laboratories of your own colleagues in the paint industry. Several people in your own field can be expected to develop polymerization know-how and equipment to serve as polymer suppliers.

We, as manufacturers of monomers, recognize a certain responsibility to your field in the way of aiding development by supply of technical information. We have faith in the future of latex paints as large volume business. Consequently we expect to provide in increasing quantity certain preliminary polymerization know-how for our monomers—complete with typical recipes which can serve as research starting points. In this way we feel we can best serve you in your efforts to develop to the fullest extent the potentialities of latex paints.

NEWS

Industrial and Architectural Finishes Discussed in Rochester

Leading industrialists in the Rochester, N. Y., area became better acquainted with the potentials of modern architectural and industrial finishes as the result of a discussion on "Novelty Finishes" at a recent meeting sponsored by the Industrial Management Council of Rochester.

Principal speaker was B. F. Ames, general sales manager of Maas & Waldstein Co., Newark, N. J., Chicago, and Los Angeles, who reviewed the history of organic finishes, compared some of the earlier types of coatings with those of the present day, and discussed the problems and limitations of each from the viewpoint of modern research and development.

Because of current interest in the new multicolored, textured enamels, he described "Plextone," his company's contribution to the paint industry. An actual demonstration showed how a mixture of black and white enamels produced not the expected shade of gray—but an interlacing beautiful multicolored network of the original colors. Mr. Ames explained how new formulations permit any combination of two or three colors to remain separate without merging or blending in the liquid state.

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Virginia Plant to Produce Tall Oil For Hercules Powder Co. in 1956

Hercules Powder Co. has taken options on an 80-acre site in Southampton County, near Franklin, Va., and will build a plant for the processing of crude tall oil into resin fatty acids and other related products.

The plant, which is scheduled for production in January, 1956, is expected to employ about 50 people, and have an annual capacity of 35,000 tons.

•

Wallace & Tiernan Absorbs W. C. Hardesty Co., Inc.

The Harchem Div., Wallace & Tiernan, Inc., will conduct all operations that were carried on by the W. C. Hardesty Co., Inc. The announcement was made by F. G. Merckel, president of Wallace & Tiernan, who said the change would be effective on Jan. 1.

He said that the change is being made to affect certain operating economies. W. C. Hardesty & Co., Inc., is a wholly owned subsidiary of Wallace & Tiernan, and the change will not otherwise affect the activities of Hardesty in the fatty acid and plasticizer fields.

Full Scale Vegetable Oil Refinery Developed by Sharples Corp.

The Sharples Corp. claims a new era has been reached in research for the billion dollar vegetable oil refining industry with the company's recent opening of a commercial sized demonstration refinery.

Said to be the first of its kind in the world, the plant has a capacity of one tank car per day (60,000 lbs.) and is so designed that crude vegetable oil can be refined by any one of five different processes currently used in the production of such products as salad oil, shortening, oleomargarine, etc..

The new refinery occupies over 15,000 sq. ft. on three floors and replaces a pilot plant. One of its unique features is the placement of weigh tanks throughout the system which permit an accurate recording of every element of the crude oil which is refined or removed as a by product or waste. Under such conditions accurate comparisons of processes and variations in processing are possible, and results obtained can be reproduced with similar equipment anywhere.

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Two New Firms Admitted To Paint Research Associates, Inc.

The British-American Paint Co., Ltd. of Victoria, B. C., and George D. Wetherill & Co., Philadelphia, have been admitted to membership in the Paint Research Associates, Inc., Chicago. With these additions, the roster of independent paint manufacturers comprising the group rises to fourteen.

DRYING OIL—

(From page 30)

Chemical Processes

The use of oil derivatives as chemical intermediates has led recently to the development of coating materials that have no counterpart in nature. The following reactions may be considered as the basic transformations giving rise to coating oleochemicals:

1. esterification of fatty acids with higher alcohols
2. varnish "cooking"
3. polyesterification and alkyd manufacture
4. removal of hydroxy and keto groups
5. isomerization
6. dimerization and polymerization
7. halogenation and dehalogenation
8. oxidative degradations
9. epoxidation
10. maleinization and other Diels-Alder condensations
11. copolymerization

Future chapters will discuss the above topics in more detail under the following general headings: Refinery Operations, Physical Processes, and Chemical Processes.

To help coordinate this material, the phenomena of "drying" and the related oxidation mechanisms will be interpreted.

•

Pentachlorophenol Pilot Plant Established in Seattle by Reichhold

Reichhold Chemicals, Inc. has entered the field of wood preservatives with the establishment in Seattle of a pilot plant for the production of pentachlorophenol by a new process, it was announced by Henry H. Reichhold, chairman of the board.

Now producing 30,000 pounds of pentachlorophenol a month, the plant will soon be supplemented by a full-size production unit, currently under construction. It will at first have an annual capacity of 2,000,000 pounds, and is expected eventually to produce about 6,000,000 pounds annually.

Reichhold's output of pentachlorophenol is based on a new process for the production of halogenated organic chemicals developed by the company's researchists in an effort begun in 1947.

CALENDAR OF EVENTS

Jan. 26-28, Association of American Soap and Glycerine Producers Annual Convention, Waldorf-Astoria Hotel, New York, N. Y.

Feb. 24-25. 9th Divisional Conference of the Protective Coatings Div. of the Chemical Institute of Canada. Feb. 24 — Royal York Hotel, Toronto; Feb. 25 — Ritz Carlton Hotel, Montreal.

Mar. 2-5. Southern Paint and Varnish Production Club Annual Convention, Hotel Biltmore, Atlanta, Ga.

Mar. 22-24. Third Biennial Spring Symposium and Raw Materials Exhibit of West Coast Paint and Varnish Production Clubs, Statler Hotel, Los Angeles, Calif.

April 4-7. Spring Meeting of Div. of Paint, Plastics and Printing Ink Chemistry, ACS, Cincinnati, Ohio.

Production Club Meetings

Baltimore, 2nd Friday, Park Plaza Hotel.
Chicago, 1st Monday, Furniture Mart.
C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April, Suttmillers.
Indianapolis — Sept., Claypoll Hotel.
Columbus — Jan., June, Fort Hayes Hotel.
Cleveland, 3rd Friday, Harvey Restaurant.
Dallas, 2nd Thursday, No Fixed Place.
Detroit, 4th Tuesday, Rackham Building.
Golden Gate, Last Monday, E. Jardin Restaurant, San Francisco.
Houston, 2nd Tuesday, Seven Seas Restaurant.
Kansas City, 2nd Wednesday, Pickwick Hotel.
Los Angeles, 2nd Wednesday, Scully's Cafe.
Louisville, 3rd Wednesday, Seelbach Hotel.
Montreal, 1st Wednesday, Queen's Hotel.
New England, 3rd Thursday, Puritan Hotel, Boston.
New York, 1st Thursday, Brass Rail, 100 Park Ave.
Northwestern, 1st Friday, St. Paul Town and Country Club.
Pacific Northwest, Annual Meetings Only.
Philadelphia, 3rd Wednesday, Engineer's Club.
Pittsburgh, 1st Monday, Fort Pitt Hotel.
St. Louis, 3rd Tuesday, Forest Park Hotel.
Southern, Annual Meetings Only.
Toronto, 3rd Monday, Diana Sweets, Ltd.
Western New York, 1st Monday 40-8 Club, Buffalo.

TECHNICAL Bulletins

SAFETY DEVICES

A complete line of combustible gas analyzers and alarms are described in a 20-page brochure.

Details of how these instruments work, and part-by-part descriptions of the components of the analyzers are included. Installations in varied industries are covered, and a method for designing a combustible gas alarm system is shown schematically. Instruments to protect against most of the known gases and vapors are described.

The brochure, #0703-3, can be obtained from Mine Safety Appliances Co., 201 North Braddock Ave., Pittsburgh 8, Pa.

TEMPERATURE CONTROLS

Bulletin 104, the fourth in a series describing company's line of temperature controls, has just been issued.

It covers the Model D-1S, primarily used for controlling temperatures up to 1800°F, where a wide and easily adjustable range is required. Topics covered are: Purpose; Operation; Tube Construction; Switches; Switch Action; and Tube Materials. Burling Instrument Co., Inc., 16 River Rd., Chatham, N. J.

MICROORGANISM CONTROL

Bulletin 4 PAM entitled, "Microorganism Control in the Paint Industry," has just been published by Buckman Laboratories, Inc., Memphis 8, Tenn. The 18-page bulletin is illustrated and has an appendix.

The introduction treats the company's product, "Butrol," which is claimed to meet the need for a preservative combining the properties of the phenyl-type organomercurials with those of orthophenylphenate. Properties and ease of use and handling are discussed.

A section on oil-base paints treats compatibility and preparation of molded surfaces for painting.

A section on emulsion paints deals with types of spoilage; preservation of protein protective colloid solutions; preservation of carbohydrate protective colloid solutions; preservation of tinting colors; preservation of butadiene-styrene emulsion paint; preservation of polyvinyl emulsion paint; mold resistant polyvinyl emulsion paint; acrylic emulsion paints; and cleaning of systems.

GRINDING MEDIA

A 12-page technical bulletin on "Coors High Density Grinding Media and Mill Lining Brick of Alumina Ceramic" has just been published.

The publication is designed to assist users of ball mills and pebble mills in obtaining maximum grinding efficiency and the elimination of color contamination through the use of high density grinding media and lining brick. Specific recommendations on mill operation are based on practical experience in the milling of many materials including paint pigments, ceramics, porcelain enamel frits, minerals, etc.

A section is devoted to actual case histories which show how the use of high density media can save production time and thereby cut manufacturing costs.

Copies may be obtained by writing Coors Porcelain Co., % LZP Industrial Ceramics, 2500 W. 7th Ave., Denver 4, Colo.

PIGMENTS

A folder of specimen colors, practical formulations of Harshaw Cadmium Lithopone pigments, show total pigmentation for full strength, middle, and tints. Included is a chart listing properties as to shade; specific gravity; weight (lbs.) per solid gallon; one pound bulks (gals); oil absorption; hiding power. The Harshaw Chemical Co., Cleveland 6, Ohio.

SEAL-LESS PUMPS

A 12-page paper detailing the design and development of centrifugal pumps that have no seals or stuffing boxes is now available to general industry.

The article covers design history, early experimental work and outlines the basic problem of building and electric motor inside a pump. Included are detailed data and curves regarding temperature, pressure, and the effects of the unusual pump design on electric motor operation. New developments in the canned rotor pump field are discussed, and a series of operational case histories are given.

Copies are available from Chempump Corp., Station B, 1300 East Mermaid Lane, Philadelphia 18, Pa.

DISPERSION PROBLEMS

A new, profusely illustrated, detailed publication on dispersion problems for chemical processes in industry is now available through the Kinetic Dispersion Corp., manufacturer of the Kady Mill.

It contains comparison charts of results of various dispersion methods used in industry and other technical data of vital interest.

A portion of the book consists of material from lectures of C. C. Candee, Technical Consultant, given at the University of North Dakota on the behavior of materials in solid, liquid and dispersional phases.

In addition there is complete operational information on formulas for a number of Kady Mill coating materials.

A copy may be obtained by writing the Kinetic Dispersion Corporation, 95 Botsford Place, Buffalo, N. Y.

MICA IN PVA-ALKYDS

Technical bulletin No. 19, issued by the Wet Ground Mica Association, Inc., 420 Lexington Ave., New York 17, N. Y., is entitled, "The Use of Wet Ground Mica in Vinyl Acetate Co-Polymer Latex Alkyd Paint-Part II."

Six tables include information on the base formulation used; comparison of various micas and extenders on the electrical resistance of water; behavior of the test paints in ultraviolet light exposure—using twin arc weatherometer without water spray; washability of the test paints; washability of the test paints on glass (continuous double-strokes); and removal of stains from test paints on glass and visual appearance after 500 double-strokes.

An introduction and summary are included.

RESIN DEVELOPMENTS

Translations of research reports and patent applications of new German processes for producing synthetic elastomers and adapting them to various end uses are catalogued in the Research Information Service Bulletin No. 92, entitled "Synthetic Rubber." The bulletin gives titles, abstracts and bibliographic data on more than two dozen translations.

It is divided into two main sections, "Production and Properties," and "Compounding and Processing."

Particulars on the reports contained in the bulletin are available free from Research Information Service, 53 Nassau St., New York 38, N. Y.

SPECIFICATIONS

The fourteenth edition of the "Guide to United States Government Paint Specifications," has been published by the National Paint, Varnish and Lacquer Association, Inc., Washington, D. C.

Compiled by W. M. Lawall, Technical Division, the Guide covers Federal, Army, Navy, and Military specifications. The text is 209 pages and a 4-page numerical index is included.

Instructions for obtaining copies of the complete specifications abstracted in the book are given under each agency heading.

ORGANIC CARBONATES

Ethylene carbonate and propylene carbonate are described in an eight-page technical bulletin just issued by Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

Information is given on physical, chemical, and physiological properties; shipping container contents; solubilities for resins and organic solvents; and uses and suggested applications. Typical reactions of these glycol carbonates are included as well as a selection of literature references.

Copies of this new technical bulletin (F-8307) are available from Carbide and Carbon Chemicals Company, 30 East 42nd Street, New York 17, N. Y.

TEFLON

An illustrated, 60-page, manual tells the story of "Teflon", tetrafluoroethylene resin.

Printed in color and illustrated with pictures, graphs, and charts, it traces the product's history; general characteristics; manufacture; compositions; uses; and properties. Under a section called, "Processing Techniques", there is included sections on molding; ram extrusion; calendering; extrusion; casting and dip-coating; and impregnation.

There are separate sections on the use of fillers with "Teflon"; standard products made with "Teflon"; fabricating techniques; and coloring "Teflon". A bibliography is included.

Copies of the manual are available free from the Polychemicals Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.

COLOR ENAMELS

A set of enamel grinds are shown on eight color cards. These grinds were produced by the high speed stone mill which is manufactured by Morehouse Industries, 1150 San Fernando Rd., Los Angeles 65, Calif.

Formulations are detailed on the back of the cars.

ROTARY TRUCK PUMP

The company's "Gold Seal" rotary truck pump, which is applied to handling petroleum products and aromatic aviation fuels and solvents, is completely described in a 4-page specification sheet which describes features, construction details and general dimensions as well as a selection chart as a guide to proper application in terms of truck mounting data. For sheet 200 C write Blackmer Pump Co., Grand Rapids, Mich.

MAGNESIUM HAND TRUCKS

Lightness, all-bolted construction, and choice of models and accessories, are stressed in a 4-page catalog-bulletin by Magnesium Company of America.

It uses actual photographs to show design, construction features and on-the-job applications of the recently-redesigned hand truck line.

Copies and further information are available from Magnesium Company of America, Materials Handling Div., East Chicago 19, Ind.

DETERIORATION

The Prevention of Deterioration Center, National Academy of Sciences—National Research

Council, has published the new collaboration, *Deterioration of Materials—Causes and Preventive Techniques*. The volume was prepared under the joint auspices of PDC and the Services Technical Committee of the Department of Defense. Publisher is the Reinhold Publishing Corp., New York City.

Compiled by 24 specialist contributors, and edited by Glenn A. Greathouse and Carl J. Wessel, director and associate director, respectively, of the PDC, this 835-page work comprises 255 illustrations, almost 1500 documentary references to the scientific literature, a thorough subject index, and a foreword by Vannevar Bush, president of the Carnegie Institution of Washington and wartime Director of the Office of Scientific Research and Development. Retail price is $12.

SPECIALTY COATINGS

An 8-page booklet entitled, "New Ideas for Diversification With Specialty Coatings," covers synthetic resins, dispersion resins, and equipment requirements for specialty coatings; and raw material suppliers.

Considered are natural rubber "Pliolite"; "Pliovic" resin; and "Chemigum" latex.

Goodyear Chemical Division, 1144 E. Market St., Akron 16, Ohio.

DRUM RINGS

A 14-page booklet lists general information on drum rings as well as specific information on: bolted types. . .plain lug rings; spin seal rings; weld nut rings; overlapping rings; drum parts closing tool; plain lever ring; lever bolt rings; miscellaneous rings; and accessories. Shipping information on the products is included. Drum Parts, Inc., 10311 Meech Ave., Cleveland 5, Ohio.

SOLVENTS

A catalog which presents the various aromatics and solvents produced by Eastern States Chemical Corp. is now available. The properties, specifications, and applications of each solvent are presented in a manner which offers quick reference to each particular item. Write to Eastern States Chemical Corp., Houston, Texas.

New Books

Organic Syntheses

Volume 34 in the "Organic Syntheses" series. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 121 pages. Price $3.50.

This new addition to the well-known annual publication supplies the most convenient methods in the preparation of 34 reactions, contributed by 56 chemists. In accordance with the established procedure of the series, each reaction has been thoroughly checked and tested in the laboratory before publication.

The board of editors of "Organic Syntheses" consists of Richard T. Arnold, T. L. Cairns, James Cason, Nelson J. Leonard, Charles C. Price, John C. Sheehan, and Max Tishler. William S. Johnson, Homer Adkins professor of chemistry at the University of Wisconsin, is editor-in-chief of the current volume.

Materials Development—1954

1954 Edition. Published by Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y. 160 pages. Price $7.50.

Hundreds of problems facing product designers in their selection of materials are discussed in "Materials for Product Development—1954." The book, second of a series, contains the proceedings of the Basic Materials Conference, held in Chicago last May, where six basic problems were under consideration. These were "Materials of the Future"; "New Metal Forming Processes," such as precision castings, powder metallurgy, forging, extrusion and stamping; "Non-Metallic Materials," including plastics, carbon-graphite, ceramics and glass; "Joining," with emphasis on adhesives and adhesive bonding of metals and plastics; "Corrosion Protection," and "Materials Management," a description of how to set up and operate a materials department.

In addition to the text of the papers presented by 13 speakers, the book contains 27 illustrations, tables and diagrams. One of the highlights is the inclusion of 258 questions and answers presented at the meetings.

The publishers produced the conference and the con-current Basic Materials Exposition. They will send the book without charge to all who attended the conference.

CLASSIFIED ADVERTISEMENTS

Rates: $.20 per word, except those seeking employment, for which rate is $.10 per word. Minimum: ten words. Address all replies to Box Number, c/o Paint and Varnish Production, 855 Avenue of the Americas, New York 1, New York.

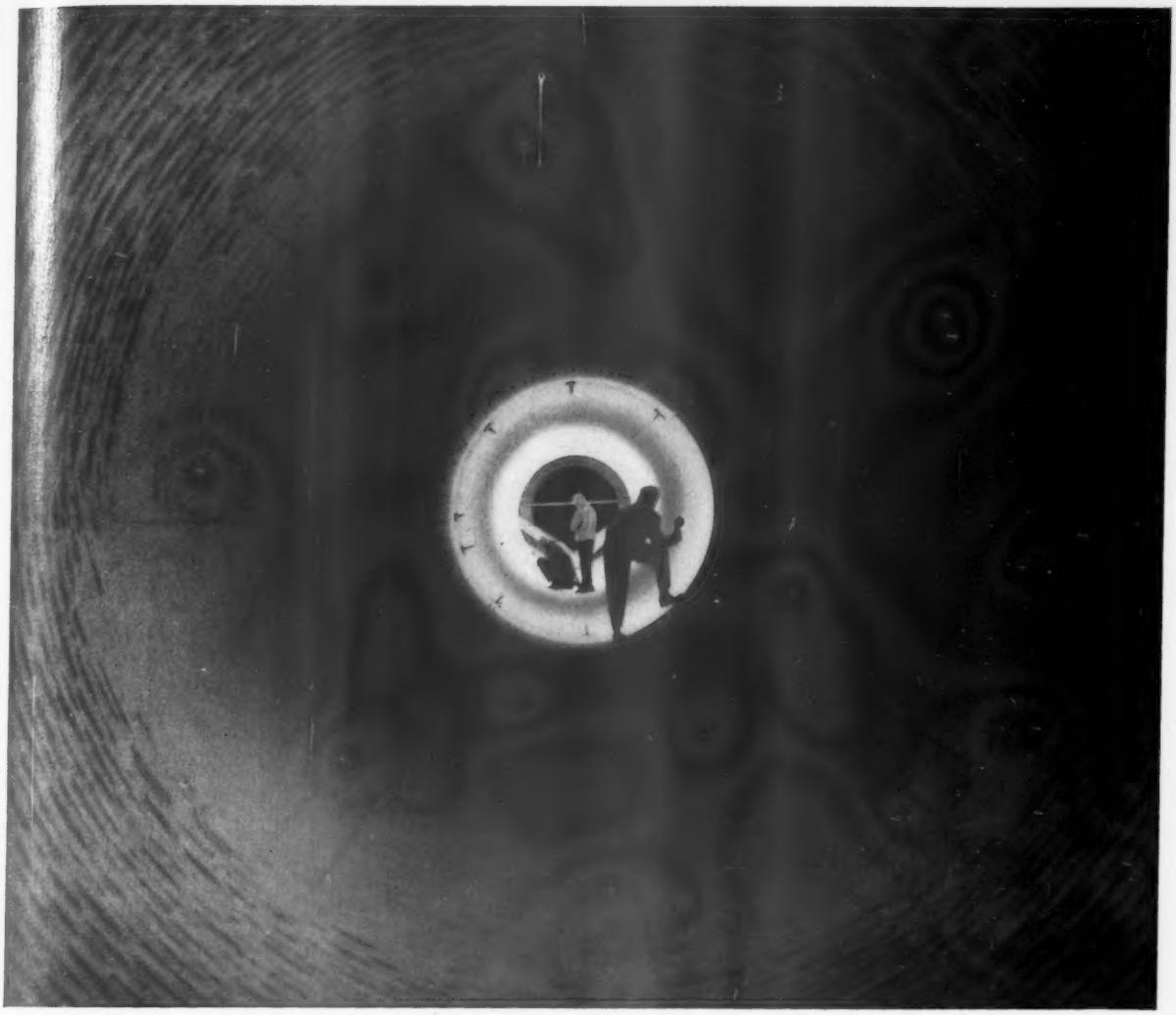
SALES REP WANTED

Technical sales representative, N. E. Metropolitan New York, N. J., eastern Penna., by white pigment manufacturer of 325 mesh and micron grades for past 48 years. Protected territory. Salary, expenses, plus tonnage bonus. Technical knowledge of modern, oil and emulsion plants, P V A, Latex, caulking compound desirable. Excellent, permanent opportunity for right man. Give full details in letter covering experience, education, age, references. Box 155.

CONNECTION WANTED

M. I. T. graduate, B.S. in chemistry, desires laboratory and production position. Some formulating experience, heavy experience in maintenance paint sales to chemical industry. Box 156.

ADVERTISERS' INDEX



bull's-eye for quality

This huge calciner represents just one step in the TITANOX quality story. In this mammoth rotary kiln, titanium hydrate is converted to titanium dioxide. Here are developed, through careful heat treatment, the unique optical properties of TITANOX pigments—unsurpassed whitening, brightening and opacifying power.

Subsequent operations add to these optical properties such desirable qualities as ease of dispersion and freedom from coarse particles.

From the full lines of "pure" and composite TITANOX white pigments, you can select one or a combination to fit any of your pigmentation needs. Your TITANOX representative and our Technical Service Department are always ready to help you make the right choice. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

® TITANOX

the brightest name in pigments

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

How HYDRITE Kaolinites affect CONTRAST RATIO

in Butadiene-Styrene Copolymer Latex Paints

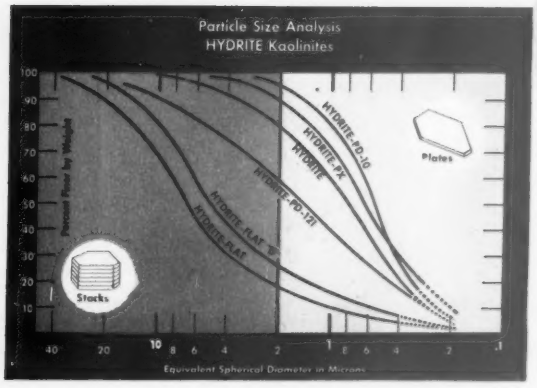
HYDRITE Kaolinites impart an exceptional degree of dry hide to water dispersed paint systems for extender pigments. The amount of dry hide which each grade is capable of imparting, depends largely on its particle size distribution, or, more exactly, on its ratio of plates to stacks.

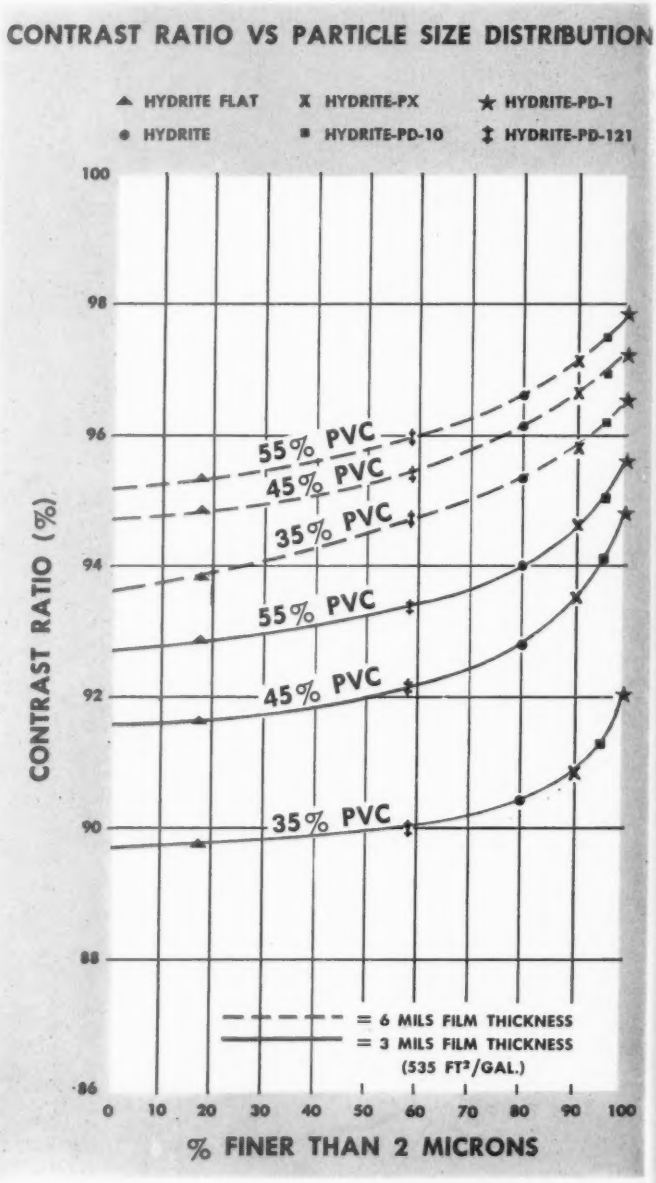
Previous ads in this series have brought out that as kaolinite particles change in size, they also change in shape. Finer than 2 microns they exist as thin, flat, hexagonal plates—coarser, as stacks of these plates so firmly bound together by natural forces that they act as single particles.

The curves at the right were obtained using HYDRITE Kaolinites ranging in particle size from 4 to 100% finer than 2 microns in typical butadiene-styrene formulations. Amount of prime hiding pigments were held constant, only kaolinite content being varied to affect the differences in PVC.

It is obvious that the grade of HYDRITE Kaolinite selected can have an important bearing on dry hiding properties. Effect on gloss, as described previously in this series, must also be taken into account in determining which HYDRITE Kaolinite should be used to give the finished formulation its desired balance of properties. Further details are given in our Technical Service Bulletin TSBH-11.

Send for it.





GEORGIA KAOLIN COMPANY

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